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DISCRIMINATION, SOCIAL IDENTITY, AND COORDINATION: AN EXPERIMENT

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Discrimination, Social Identity, and Coordination: An Experiment*

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Abstract

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Keywords: social identity, discrimination, favoritism, coordination, experimental evidence

JEL Classification: C72, C91, D84, J71

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1 Introduction

Discrimination matters because of fairness and efficiency concerns.[1] Identifying and tackling it is, however, a difficult task, and discrimination persists in many countries and various spheres of life.[2] Discrimination is often related to social identities, i.e., people are treated differently based on which social group they belong to. This paper considers the question whether decision makers discriminate between candidates belonging to their own group and candidates belonging to another group in hiring decisions under uncertainty. On the one hand, we are interested in whether they do so when making decisions alone. On the other hand, we would like to find out whether people discriminate in joint decisions, i.e., in situations where they have an incentive to coordinate their decision with a co-decision maker. We also want to learn more about whether the group identity of the co-decision maker may matter in joint decisions.

We conducted a controlled laboratory experiment to investigate the basic questions presented above concerning the relationship between discrimination and social identity. In this experiment, decision makers had to make project assignment decisions about whether to assign a project to a candidate or not in a situation in which the outcome of the project was uncertain.[3] There were two types of sessions - control sessions and identity sessions. In identity sessions participants were randomly divided into two groups, and each of these groups separately underwent a group identity building stage before proceeding to the hiring decisions. That is, in identity sessions we created groups and induced group identities in the lab. In control sessions participants proceeded directly to the hiring decisions. Each decision maker in each session made some individual as well as some joint decisions. In joint decisions they had an incentive to coordinate their decisions with a co-decision maker. We systematically varied co-decision maker identity.

A key novel aspect and motivation for this study is that we are able to compare the choices that people make when deciding alone with those they make when having to coordinate with a co-decision maker in otherwise identical situations, something that is not feasible in an uncontrolled environment. This helps to enhance our understanding of the sources of discrimination. A further

[1]See e.g. Loury (2002) and Bramoullè and Goyal (2012).

[2]See e.g. Anwar et al. (2012), Knowles et al. (2001), Gallo et al. (2013).

[3]Throughout the paper we use the term hiring decisions as synonymous to project assignment decisions for simplicity of exposition.

motivating factor is the observation that the real world abounds with cases in which two or more people make a joint decision about a third party. Examples include hiring, promotions, examinations, allocation of public contracts, juries, as well as many more informal decision situations. Our study constitutes a step towards understanding the role identity may play in joint decisions. If co-decision maker identity matters even in a controlled setting, it may also create biases in more complex environments in which such biases may be difficult to uncover due to the multiplicity of additional factors involved.

We now summarize the main findings. We find substantial discrimination in both individual and joint decision-making situations. Our analysis shows that the presence/absence of discrimination, as well as the type of discriminatory behavior observed, depends on whether a person is deciding alone or trying to coordinate with someone else. It may also depend on the exact characteristics of the situation considered. In individual decisions there is more hiring of own than of other group candidates in a situation in which the expected monetary payoff from hiring a candidate is lower than the monetary payoff from not hiring the candidate, but not in the reverse case. In joint decisions, there is discrimination when the two decision makers are of the same group. There is no discrimination when deciding with a co-decision maker of the other group. By comparing behavior in identity with behavior in control sessions, we can disentangle whether the differential treatment of own and other group candidates is due to positive treatment of the own group, or to negative treatment of the other group, or to both. We find that in individual decisions the discriminatory behavior observed is driven by negative treatment of the other group. Interestingly, in joint decisions, even when deciding with someone from the own group, participants do not negatively discriminate against other group candidates, but they do strongly favor own group candidates.

There are two main messages from this study. First, the empirical findings indicate that since the type of and motives for discrimination observed in joint decisions may differ from the type of discrimination observed in individual decisions, different policies may be needed to tackle them. Second, the finding that co-decision maker identity plays a role even in a controlled environment contributes to the debate on whether the composition of decision making bodies in terms of the social identities of their members may matter for decisions.

The structure of the paper is as follows. In section 2 we discuss some related literature. Section 3 provides details of the experimental design and implementation. Section 4 details our hypotheses. In section 5 we present our analysis of the experimental data. Section 6 is a discussion of the results, and section 7 concludes.

2 Related Literature

This paper belongs to the literature on how social identity affects decisions.[4] Experimental findings from social psychology show that even when people are divided into two groups in the laboratory on the basis of something as unimportant as aesthetic preferences, and even when they expect no future interactions with one another, they discriminate between members of their own and members of the other group: i.e. they may overvalue the characteristics of in-group compared to those of out-group members; furthermore, when asked to allocate tokens between a member of their own and of the other group, they may give more to an in-group member than to an out-group member (Tajfel and Turner, 1979).[5] Social Identity Theory explains why this may happen (Tajfel and Turner, 1979; Tajfel, 1982): People are categorized and self-categorize into groups, they identify with their group, and they derive self-esteem from a high status of the in-group. Favoring the in-group over the out-group thus brings them higher utility.

A number of recent experiments in economics have investigated whether group identity may affect decisions in various situations. Some of these studies consider the effect of natural social identities, i.e., social group affiliations existing outside the laboratory (Bernhard et al., 2006; Goette et al., 2006). Some other studies induce group identity in the laboratory, either by dividing people into two groups based on their aesthetic preferences as in social psychology experiments (Chen and Li, 2009), or by randomly dividing people into two groups, assigning a label to each group and using some method to strengthen group identity (Eckel and Grossman, 2005; Charness et al., 2007; Chen and Chen, 2011). The methods used to strengthen group identity include working with the group on an unrelated common problem (either paid or unpaid) in a pre-decision making stage to create a shared experience, introducing payoff interdependence for members of a group

[4]The role of social identity has been widely recognized and researched in various fields such as sociology, anthropology, social psychology, philosophy, history, and more recently in economics. The aim here is not to give an overview of the extensive literature, but just to highlight the most relevant strands and how this study relates to them.

[5]For an overview of the literature in social psychology, see Brown (2000).

for this common problem, introducing competition between the groups for the solution of this common problem, and the presence of an audience from the own (other) group during the decision making stage. The consensus appears to be that just randomly dividing participants into two groups and labeling them is insufficient to induce group identity effects. However, if additionally to the labeling people undergo a shared experience, the sense of identification created through this shared experience is often sufficient to generate differences in subsequent behavior towards own and towards other group members (Chen and Chen, 2011; Eckel and Grossman, 2005). In this study we induce identities in the lab by randomly assigning people to groups and letting them work together on a common problem. In doing so we abstract from the specificity of relations within and between groups existing in society, as well as from the influence of tastes and stereotypes existing in society about particular groups and their historical relations. This method focuses on the basic question whether people discriminate between members of their own group and members of another group and thus complements studies based on social identities existing outside the lab.

Social identity experiments in economics have found that social identity may affect behavior in various situations such as contributions in a public goods game (Eckel and Grossman, 2005), coordination in the Battle of the Sexes (Charness et al., 2007), cooperation in the Prisoner's Dilemma (Charness et al., 2007), and coordination on a Pareto superior outcome in the Minimum Effort Game (Chen and Chen, 2011). Chen and Li (2009) use a number of different games to quantify differences in altruism, reciprocity, and punishment towards in- and out-group members. Klor and Shayo (2010) find that subjects vote for a tax policy that benefits the social group they belong to if the personal monetary costs of doing so are not too high. In Li et al. (2011) group identity affects the choice of trading partners and the prices realized in an experimental oligopolistic market. Goette et al.'s (2006) and Bernhard et al.'s (2006) studies using natural social groups show that group identity may matter for punishment decisions. In our setting decision makers make decisions about whether to assign a project to a candidate or not.

This study is also related to the experimental literature on discrimination. Discrimination in a labor market context has been investigated, for example, in a field experiment by Bertrand and Mullainathan (2004), who find that employers' callback rates differ depending on whether a candidate has a "white" or an "African American" sounding name although the applicants from the two groups are equally qualified. Fershtman and Gneezy (2001), Gneezy et al. (2012), and List (2004) look into rationales behind discrimination and show that taste based and statistical discrimination explanations can account for some discrimination in various settings. As will become clear later, the situation considered in this study explores a further motive for discrimination. There are also numerous studies testing for discrimination in naturally occurring data, some considering individual decisions and others, committee decisions.[6] To sum up, this paper adds to the literature by testing both for discrimination in individual project assignment decisions and for discrimination in joint decisions controlling for the productivity of the candidates. We also investigate the effect of co-decision maker identity in a stylized joint decision-making situation, keeping all else equal.

3 Experimental Design

This experiment investigates behavior in project assignment decisions. We study whether group identity plays a role in such decisions. One of the treatment variables is therefore group identity, and we have two types of sessions - control sessions without group identity, and treatment sessions with group identity. A key objective of the experiment is to compare individual behavior in individual and in joint decision making situations. In both types of sessions therefore the decision makers made some individual as well as some joint decisions. Thus, the type of decision is a second focus variable. In identity sessions, we also vary the group identity of the co-decision maker.

We ran eight control and eight identity sessions. There were twelve subjects in each session. Allocation to sessions was random. In each identity session participants were randomly divided into two groups of six, and each group underwent an identity building stage before proceeding to the hiring decisions. In control sessions participants proceeded directly to the hiring decisions. At the beginning of the hiring stage, subjects received instructions about this stage and completed a questionnaire to make sure that they have understood the

[6] For individual decisions, see for example, Shayo and Zussman (2011) who analyze decisions of Arab and Jewish judges in Israeli small courts claims and find that judges from both groups exhibit an in-group bias. Studies on the effect of group identities in committee/ joint decision-making situations include the following: Anwar et al. (2012) on racial composition of the jury and decisions in criminal trials; Bagues and Esteve-Volart (2010) on gender and examination committees in the Spanish judicial system; Price and Wolfers (2010) on own-race bias of NBA refereeing crews and Antonovics and Knight (2009); Bunzel and Marcoul (2008); Knowles et al. (2001) on racial bias in vehicle search decisions by police officers.

instructions. They were told that for each situation in which they have to make a decision, they would be randomly and anonymously matched with some other participant(s). They would never learn who they were matched with. After receiving all instructions subjects were assigned either the role of decision maker or the role of project candidate, which they kept until the end of the session. In each session, eight subjects had the role of decision makers and four had the role of project candidates. The roles were assigned randomly and anonymously.

Each decision maker made some individual as well as some joint decisions. Individual decisions meant she had full decision power. In joint decisions, two decision makers decided anonymously and independently of each other whether to hire a candidate or not. They had an incentive to coordinate, and if their decisions were not coordinated, no hiring decision was implemented. Each project candidate was asked for their beliefs about what the decision makers would do in a given hiring situation. During the experiment subjects would never receive any feedback about any decisions taken by them or by others.

The experiment was conducted in 2012 at Queen Mary University of London. All 192 participants were undergraduate students at Queen Mary who were randomly drawn from a database of students interested in participating in experiments. The experimental instructions are included in Appendix D. Control sessions lasted about an hour and identity sessions lasted about an hour and a half. The average earnings across all sessions were £19.13, which included a £3 show up fee.

3.1 Control Sessions

Each decision maker in a control session made four project assignment decisions. Two of them were individual decisions, and two of them were joint decisions (see Table 1). In an individual decision making situation, the decision maker has a budget of £3.42 and has to decide whether to assign a project to a candidate or not. If she does not assign the project to the candidate, the decision maker can keep the budget for herself. If she assigns the project to the candidate, the decision maker has to pay the candidate £3.42 for her services. The decision maker does not know in advance whether the project will be successful or not, but knows that chances of success are p_i in 100 ($0 < p_i < 100$). If the project is completed successfully, the decision maker will get £x_i. If the project is not completed successfully, the decision maker will get £y_i. The two sets of parameter values used were: $p_1 = 35$ in 100, $x_1 =$ £9.70, $y_1 =$ £0.50 for one of the individual questions, and $p_2 = 45$ in 100, $x_2 = £6.20$, $y_2 = £0.60$ for the other individual question. Under parameter set 1, the expected payoff from hiring a candidate £3.72 is slightly higher than the payoff from not hiring a candidate £3.42, whereas under parameter set 2, the opposite holds (£3.42 from not hiring versus £3.12 from hiring). The difference in expected payoffs from hiring versus not hiring the candidate in the two cases is the same in absolute terms.

The two joint decisions that a decision maker faced involved the same two sets of parameter values as the individual decisions. The difference is that the decision makers are now told that there are two of them, and each of them has to decide independently whether to assign the project to the candidate or not. If both decision makers decide not to assign the project to the candidate, then the project is not assigned, and each of them keeps the £3.42 for herself. If both decision makers decide to assign the project to the candidate, then the project is assigned, and each of them has to pay the candidate £3.42 for her services. If the two decision makers make different decisions, then no project assignment decision is implemented, and each decision maker incurs a disagreement cost of £3, to be deducted from her budget. The parameter values were chosen with two considerations in mind: first, so that under both sets of parameter values we could expect that in the absence of group identity there would be some subjects who choose to assign as well as some subjects who choose not to assign the project to the candidates.[7] Second, they were chosen so that under each parameter set there exist two Nash equilibria in the joint decision making problem - corresponding to the situations in which either both hire or both do not hire the candidate.

In all sessions the participants were told in the instructions that in order to determine whether a project is successful or not a draw would be made from a bag containing red and black chips at the end of the experiment. The number of red and black chips in the bag corresponded to the chances that a project is successful versus unsuccessful in a given decision situation.

We presented each candidate in a control session with the four questions a decision maker faced, and we asked for each case what she thought the decision maker would do. A candidate received £3 for each correct answer.

3.2 Identity Sessions

In identity sessions, group identity was induced in the lab in a stage preceding the hiring decisions. Group assignment was random. Upon entering the room

[7] See e.g. Holt and Laury (2002) or Ambrus et al. (2009).

Table 1: Set of Decisions for a Decision Maker in a Control/ Identity Session

	Control Sessions	**Identity Sessions**
Individual	about PC set j about PC set k	about own PC set j about other PC set k
Joint	about PC set j about PC set k	with own DM about own PC set j with other DM about own PC set j with own DM about other PC set k with other DM about other PC set k

Notes. DM: decision maker; PC: project candidate
j, k denote the parameter values related to probability of project success and payoffs

each subject drew an envelope, which contained either a blue or a green slip of paper. If a person drew a blue slip, they were told that they will be in the blue group and if they drew a green slip, they were told that they will be in the green group. In each identity session there were six blue and six green group members. After the general instructions, the members of a group were asked to sit together around a table. Each group, then, received eight paintings, four of them labeled "Artist 1", and four of them labeled "Artist 2".[8] They were told that they can discuss the paintings, and that afterwards they would be given four more paintings without labels, and would have to identify for each of these four paintings whether it was by Artist 1 or by Artist 2. Participants were allowed to discuss their answers, but answers were individual, and a participant received £2 for each correct answer.

After the identity induction stage, participants were asked to return to their individual seats. They were given the instructions for the hiring stage and the questionnaire which checked their understanding of the instructions, before receiving their decision sheets. At that point, the participants were randomly and anonymously assigned the roles of either decision maker or candidate so that in each group there were four decision makers and two candidates.

Each decision maker in an identity session made six decisions in the hiring stage. Note that the difference with the decision situations in the control sessions is that the description of the decision situation included the group identity of the decision maker(s) and the group identity of the candidate that the decision

[8]We used reproductions of paintings by Paul Klee and Wassily Kandinsky (see also Chen and Chen, 2011; Chen and Li, 2009).

was about. For example, you are a "blue" decision maker and you are randomly matched to a "green" project candidate. One individual decision was about a candidate of the own group under one set of parameter values, and the other individual decision was about a candidate of the other group under the other set of parameter values (see Table 1). Besides these two individual decisions, each decision maker also made four joint decisions: one with a decision maker of the own group about a candidate of the own group, one with a decision maker of the own group about a candidate of the other group, one with a decision maker of the other group about a candidate of the own group, and one with a decision maker of the other group about a candidate of the other group. Note that for each individual decision maker the set of parameter values used for questions about own group candidates differed from the set used in questions about other group candidates. Each project candidate in an identity session answered the corresponding six questions about what she thought a decision maker would do in each of the six situations described above.

3.3 Comparisons and Features

The comparisons we make are illustrated in Figure 1. In identity sessions we compare behavior towards own with behavior towards other group candidates both in individual (comparison 1) and in joint decisions (comparison 3). In addition, in joint decisions in identity sessions we analyze how the choices depend on the configurations of the identities of the decision makers and the candidate (comparison 3). We also compare choices in identity sessions with choices in control sessions, both for the individual and for the joint decisions (comparisons 2 and 4). And finally, we compare behavior in joint with behavior in individual decisions both in control and in identity sessions (comparisons 5 and 6). Some of these comparisons are within-subjects (5 and 6), some are between-subjects (1, 2, and 4), and 3 contains both some within-subjects and some between-subjects comparisons. In particular the comparisons of behavior towards own and towards other group candidates are between-subjects. By making a between-subjects comparison of the behavior towards own and towards other group candidates, the design of the experiment specifically avoids testing for blatant discrimination. We would have been testing for blatant discrimination, if we had asked a decision maker to make decisions about two absolutely identical members of the own and of the other group in an absolutely identical situation (i.e. under the same parameter values). This could potentially induce experimenter demand effects, as decision makers might notice that the candidates differ only in their group identity. Therefore, as a precaution against the subjects becoming aware that we are testing for discrimination, we vary not only the group identity of the candidates that a decision maker faces, but also the parameter values attached to them. That is, in our set-up a decision maker faces own group candidates with one set of parameter values, and other group candidates with another set. The design is balanced so that overall half of the decision makers face own group candidates with parameter set 1 and other group candidates with parameter set 2, and the other half of the decision makers vice versa.

Additionally, note that a decision maker does not have to choose directly between an own and an other group candidate, but is asked separate questions about whether she would assign the project to a blue candidate with parameter set j, and whether she would assign the project to a green candidate with parameter set k. This is done to avoid pure focality effects. A pure focality effect could arise in the joint decision-making case if we had two blue decision makers and each of them had to choose whether to hire a blue or to hire a green candidate. Then hiring a blue candidate could be a focal choice. In our set-up the choice decision makers are presented with is to hire a given candidate or not. A joint decision making situation thus amounts to a pure coordination game with two Nash equilibria in pure strategies - both hire or both do not hire the candidate. Ex-ante there are no obvious focality effects highlighting either of the two equilibria.

Furthermore, we vary the matching of colors to sets of parameter values from session to session. We also randomize the order of questions of each type for each participant, and we allow participants to browse through the entire set of questions on the decision sheets in order to avoid any order effects.

The joint hiring decisions constitute a coordination problem. Such a coordination problem is a stylized representation of a wide range of social interactions. Most directly, it captures situations in which decision makers have to reach a common decision without having the opportunity to communicate with one another. But its relevance is much broader than this. Whenever two people have to undertake a common decision, even if communication is allowed, there is most often a pre-communication stage in the decision making process, in which each person considers for herself what to do and what she thinks the other person will do. In many of these situations people will care not only about the decision to be implemented but also about being coordinated, e.g. to avoid

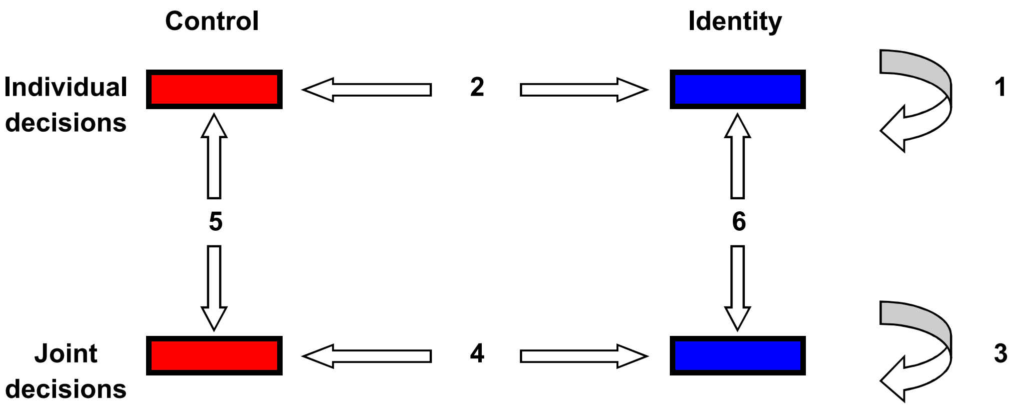


Figure 1: Comparisons

spending time on discussions, as communication and time spent on discussions involve opportunity costs. They would like to be coordinated already prior to communicating. The joint decision making situation in our experiment is an approximation of this pre-communication stage, and the miscoordination cost that we introduce captures the costs of disagreeing. Note that even in cases when decision makers will have an opportunity to communicate later or to engage in repeated interaction, the choices they make in the first pre-communication stage may have an effect on which outcome is realized later, because the initial choices can influence their beliefs about each other.[9]

4 Hypotheses

Our hypotheses on behavior in individual decisions are derived, on the one hand, from the findings of in-group bias in the social identity literature, and on the other hand, from the taste for discrimination model. It has been established in social identity experiments that people exhibit an ingroup-bias, i.e., they treat members of the own group more favorably than members of the other group (Tajfel and Turner, 1979). According to Becker (1971), an employer will discriminate between members of two groups if she has a positive taste towards one group and/or a negative taste towards the other group. We therefore hypothesize that in individual decisions if an in-group bias or a taste for discrimination in favor of the own group or against the other group exists, then members of the own group will be hired more than members of the other group. By making

[9]This would be along the lines of Farrell (1987), who shows that cheap talk may influence future interactions by creating focal points.

comparisons of behavior towards candidates in identity sessions with behavior towards candidates in control sessions, we can distinguish whether discrimination is due to positive treatment of the own group, to negative treatment of the other group or to both. We say that there is positive discrimination in favor of the own group if members of the own group are hired more than candidates in control sessions. There is negative discrimination against the other group if members of the other group are hired less than candidates in control sessions.

Furthermore, we conjecture that the exact configurations of the group identities of the parties involved may affect decisions in the joint decision making case. This conjecture is based on findings from empirical studies using non-experimental naturally occurring data that identify biases in decisions related to the configurations of the social identity of the parties involved in a joint decision making situation (e.g. Anwar et al., 2012; Bagues and Esteve-Volart, 2010; Price and Wolfers, 2010). To form the hypotheses that compare behavior in two joint decision making cases, we add up the hypotheses for the behavior of the two individuals involved. Therefore, some of the hypotheses comparing behavior in two joint decision making situations will be one-directional and some will be two-directional. An example of a one-directional alternative hypothesis is the comparison of decisions with a co-decision maker of the own group about a candidate of the own group and decisions with a co-decision maker of the own group about a candidate of the other group. According to our hypothesis on individual behavior, each of the two decision makers is expected to favor candidates of the own group and to discriminate against candidates of the other group. Therefore, we expect that the frequency with which individuals hire own group candidates when deciding with an own group co-decision maker will be higher than the frequency with which individuals hire other group candidates when deciding with an own group co-decision maker. An example of a two-directional alternative hypothesis is a comparison of the rates at which individuals hire own and other group candidates when deciding with a co-decision maker from the other group, i.e. when one decision maker may be expected to favor and the other to discriminate against the candidate. The general null hypothesis is that behavior in any pair of situations does not differ. Below we list the four groups of alternative hypotheses that we test for in our analysis of the experimental data. The numbered comparisons in brackets refer to our design chart (Figure 1).

Hypothesis 1: Discrimination in Individual Decisions
There is more hiring of own than of other group candidates in individual decisions in identity sessions (comparison 1 in the design chart).

Hypothesis 2: Discrimination in Joint Decisions
Individuals hire more own than other group candidates in joint decisions in identity sessions (comparison 3).

Hypothesis 3: Co-Decision Maker Identity and Discrimination in Joint Decisions
a. Individuals hire more own than other group candidates when deciding with an own group co-decision maker (comparison 3).
b. There is a difference in the rates at which individuals hire own and other group candidates in joint decisions with an other group co-decision maker (comparison 3).

Hypothesis 4: Differences in Behavior in Joint versus Individual Decisions
a. There is a difference in behavior in joint versus individual decisions in control sessions (comparison 5).
b. There is a difference in behavior in joint versus individual decisions in identity sessions (comparison 6).
c. There is a difference in behavior in joint versus individual decisions in identity sessions depending on the type of candidate and on the type of co-decision maker (comparison 6).

To gain further understanding of the nature of potential discrimination and to uncover whether differential treatment of own and other group candidates is due to positive treatment of the own group or to negative treatment of the other group, we also compare behavior towards own (other) group candidates in identity sessions with behavior towards candidates in control sessions.

5 Analysis of the Experimental Data

In this section we report the statistical analysis of the experimental data, testing the hypotheses presented in section 4. In order to control for potentially unobserved factors that may affect behavior in a given session instead of treating each decision in a given session as an independent observation, we treat the relative frequency of hiring in the situation of interest in one session as one independent observation. Thus in each case we have eight independent observations for control and eight independent observations for identity sessions.

The focus of the analysis is *always* on the relative frequencies with which *individual* decision makers decide to assign a project to a candidate in different decision situations. In the paper we call this interchangeably the 'frequency of hiring' or 'hiring rate'. Thus, for example, a relative frequency of hiring of 0.59 in individual decisions in identity sessions means that in 59% of the cases individual decision makers decided to assign the project to a candidate in individual decisions in identity sessions. Likewise, a relative frequency of hiring of 0.70 in joint decisions in identity sessions means that in 70% of the cases *individual* decision makers decided to assign the project to a candidate in joint decisions in identity sessions.[10]

We use standard non-parametric statistical tests for experimental analysis, taking into account that subjects are randomly allocated to sessions and treatments and that the design is balanced and based on randomization. Thus, for the statistical significance of differences in any matched pairs and related samples (i.e., all within-sessions) comparisons we use the Wilcoxon Signed Ranks Test. For the statistical tests of all independent samples (i.e., between-sessions comparisons) we use the Robust Rank Order Test. The significance level chosen is $\alpha = 0.10$.

The analysis and the levels of significance reported in the main part of the paper are based on non-parametric statistical tests as they make fewer distributional assumptions, as well as making the exposition simpler. As a robustness check we also conduct detailed regression analysis which we report in Appendix B. The regressions confirm the findings of the non-parametric statistical tests. The statistical tests conducted on the basis of the estimated regression coefficients have slightly higher power than the non-parametric statistical tests and thus the non-parametric tests we report in the main text most often give the more conservative estimate of significance. For example, in many cases a difference that is significant at $\alpha = 0.10$ using a non-parametric test is significant at $\alpha = 0.05$ using the tests based on the regressions.

[10]Note that in joint decisions the actual rate at which candidates are hired will be lower as hiring requires coordinated hiring decisions. We also analyzed the differences in expected coordination rates in the various joint decision making cases, but did not find any additional insights. We thus focus throughout the paper on individual behavior, as our main goal is to establish how individual behavior differs in alternative decision making situations.

The four subsections in our analysis below correspond to the four sets of hypotheses in section 4. In each subsection, the focus is on the decision makers' behavior aggregated over the two sets of parameter values. To go in more depth, we do, however, also test all our hypotheses on the decision makers' behavior separately for decisions under parameter set 1 and for decisions under parameter set 2. Whenever the results are sensitive to the parameter set, we mention this in the main text. At the end of each subsection, we formulate the main findings as results of the analysis.

Table 2 in Appendix A presents an overview of all statistical tests for the decision makers' behavior aggregated over the two sets of parameters. Tables 3 and 4 in Appendix A show the corresponding results for the two sets of parameter values separately. These tables include both the results of the non-parametric statistical tests reported in the main text and the p-values from the tests based on the regression coefficients.[11]

5.1 Discrimination in Individual Decisions

Figure 2 shows the data on individual hiring decisions aggregated over the two sets of parameters. There is no difference in the hiring rates in individual decisions in control and in identity sessions (both 0.59[12]). We are interested in whether there is discrimination, i.e., differential treatment of own and of other group candidates in individual decisions in identity sessions. Own group candidates are hired at a rate of 0.61, which is slightly higher than the 0.58 hiring rate of other group candidates. As to positive discrimination in individual decisions, the hiring rate of own group candidates in identity sessions is two percentage points higher than the hiring of candidates in control sessions (0.61 versus 0.59). The hiring rate of other group candidates in identity sessions is one percentage point lower than the hiring of candidates in control sessions (0.58 versus 0.59). These differences are all in line with the hypotheses on discrimination in individual decisions, but they are neither substantial nor statistically significant.

Testing the same hypotheses on decision makers' behavior separately under each of the two parameter sets allows us to check whether the presence/absence

[11]The details of the regression estimation and of the tests based on the estimated regression coefficients are in Appendix B.

[12]This is the average relative frequency of hiring in individual decisions in control/identity sessions, averaged over the eight control/identity sessions, respectively. The other numbers we report in the text have an analogical interpretation.

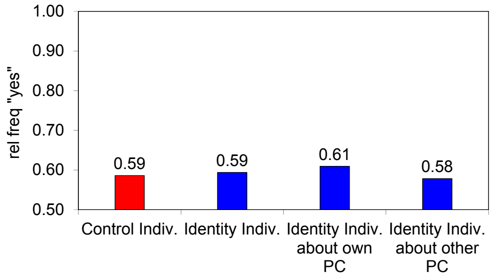


Figure 2: Individual Decisions

of discrimination in individual decisions depends on the circumstances decision makers face. The results are presented in Comparison 1 in Table 3 in Appendix A for parameter set 1 and in Comparison 1 in Table 4 for parameter set 2. Under parameter set 2, we observe substantially and significantly more hiring of own than of other group candidates in individual decisions in identity sessions. The hiring rate of own group candidates in individual decisions in identity sessions under parameter set 2 is 0.69 versus a hiring rate of other group candidates of 0.47 (difference statistically significant at $\alpha = 0.10$ level). This means that when considering own group candidates, the hiring rate is 22 percentage points higher than when considering other group candidates. The differences in decisions under parameter set 1 are not statistically significant. Thus, the analysis indicates that the occurrence of discrimination is sensitive to the exact characteristics of the situation considered. We come back to this in the discussion section.

The comparisons of hiring rates of own (respectively other) group candidates in individual decisions in identity sessions with the hiring rate in individual decisions in control sessions (in both cases for parameter set 2) reveal that the above discrimination is driven mainly by negative treatment of candidates from the other group compared to the treatment of candidates in control sessions. The hiring rate of other group candidates in identity sessions, 0.47, is 16 percentage points lower than the hiring rate of candidates in control sessions, 0.63 (difference statistically significant at $\alpha = 0.05$[13]).

Result 1: *We do not find substantial or significant evidence of discrimination in*

[13]The significance level reported in this case is according to the tests based on the estimated regression coefficients. We could not reject the hypothesis of no difference using the Robust Rank Order Test. To check the robustness of the significance using the regression-based test, we conducted an additional permutation test for significance, which shows significance at the $\alpha = 0.10$ level.

individual decisions when considering the decisions aggregated over the two sets of parameters. We do, however, find substantially and significantly less hiring of other than of own group candidates in individual decisions under parameter set 2. This discriminatory behavior under parameter set 2 is mainly driven by negative discrimination against the other group.

5.2 Discrimination in Joint Decisions

The next question we are interested in is whether there is discrimination in joint decisions. That is, do individuals hire more own than other group candidates when trying to coordinate with another decision maker? And in case such discrimination exists, we also want to know whether it is driven by negative discrimination towards other group candidates, by positive discrimination towards own group candidates, or by both.

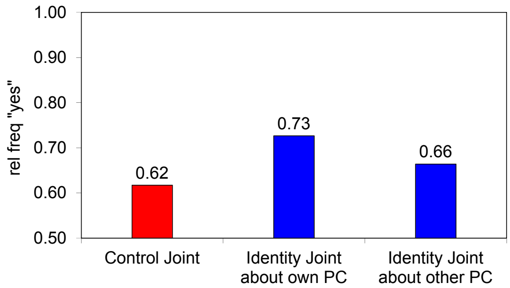


Figure 3: Joint Decisions

As Figure 3 shows, hiring of own group candidates in joint decisions in identity sessions is 7 percentage points higher than hiring of other group candidates (0.73 versus 0.66). Although not statistically significant, this difference is consistent with the discrimination hypothesis. Next, we examine whether this difference is due to negative discrimination of other group candidates, or to positive discrimination of own group candidates, or to both. As Figure 3 shows, the hiring rate of other group candidates in joint decisions in identity sessions is 0.66, which is 4 percentage points higher than the hiring rate of candidates in joint decisions in control sessions (0.62). This is not statistically significant and is contrary to the hypothesis of negative discrimination of other group candidates.

We find a substantial and significant difference in hiring of own group candidates in joint decisions in identity sessions compared to hiring of candidates in joint decisions in control sessions (0.73 versus 0.62). This difference of 11 percentage points is statistically significant (at $\alpha = 0.05$), indicating strong positive discrimination of own group candidates in joint decisions. That is, although individuals do not negatively discriminate against other group candidates in joint decisions, they discriminate by strongly favoring own group candidates.

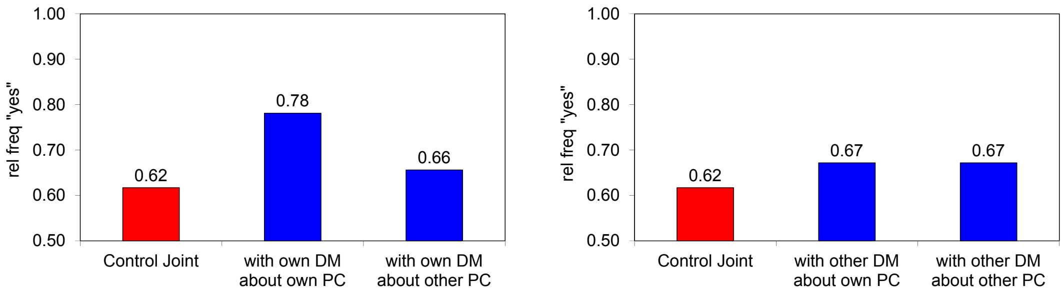
Disaggregating by parameter set, we find that under parameter set 1 there is no substantial or significant difference in treatment of own and of other group candidates in joint decisions in identity sessions. Under parameter set 2, the hiring rate of own group candidates is substantially higher than the hiring rate of other group candidates (0.84 versus 0.72, difference significant at $\alpha = 0.05$ level). This differential treatment is entirely driven by positive discrimination in favor of the own group. The hiring rate of own group candidates is 15 percentage points higher than the hiring rate of candidates in control sessions (difference statistically significant at $\alpha = 0.05$). There is no evidence of negative treatment of the other group.

Result 2: *Aggregating over the two parameter sets, decision makers hire more own than other group candidates in joint decisions. Although there is no negative discrimination against other group candidates in joint decisions, there is substantial and significant positive discrimination in favor of own group candidates in joint decisions. Looking at the two parameter sets separately, we find that the positive discrimination of the own group in joint decisions occurs under parameter set 2.*

5.3 Co-Decision Maker Identity and Discrimination in Joint Decisions

In this subsection we analyze the effect of the identity of the co-decision maker on the presence/absence of discrimination in joint decisions. That is, we ask the following questions: Does a decision maker discriminate between own and other group candidates when making a decision with a co-decision maker from the own group? And does a decision maker treat own and other group candidates differently when making a decision with someone from the other group?

Figure 4a focuses on decisions with own group co-decision maker. It shows that when deciding with someone from their own group, individual decision makers hire 12 percentage points more own group candidates than other group candidates (0.78 versus 0.66), which is statistically significant at the $\alpha = 0.10$



a) with own DM

b) with other DM

Figure 4: Co-decision Maker Identity and Discrimination

level, indicating substantial discrimination when the two decision makers are of the same group. Hiring of own group candidates when deciding with an own group decision maker is 16 percentage points higher than hiring in joint decisions in control sessions (0.78 versus 0.62), indicating again strong positive discrimination in favor of the own group (statistically significant at $\alpha = 0.05$ level). Interestingly, there is no negative discrimination towards other group candidates when deciding with someone from the own group. In fact, when deciding with an own group co-decision maker, hiring of other group candidates is 4 percentage points higher than hiring of candidates in control sessions (0.66 versus 0.62), although this difference is not statistically significant. These results are in line with the findings under each of the two parameter sets.

Result 3a: *There is strong and significant discrimination when deciding with someone from the own group. Although there is no negative discrimination towards other group candidates, there is substantial and significant positive discrimination in favor of own group candidates when deciding with someone from the own group.*

The next question is whether people discriminate when deciding with someone from the other group. As Figure 4b shows, there is no difference in the relative frequencies of hiring of own and other group candidates when deciding with an other group decision maker (both at 0.67). Both hiring of own and of other group candidates are a few percentage points higher when deciding with an other group decision maker than in control sessions (0.67 versus 0.62), but this difference is not statistically significant. Looking at each of the two parameter sets separately, we find that there is a difference under each but that these differences go in opposite directions and cancel each other out. In addition, they are not significant.

Result 3b: *There is no significant evidence that people discriminate between own and other group candidates when deciding with someone from the other group.*

5.4 Differences in Behavior in Joint versus Individual Decisions

From our analysis so far it becomes apparent that there are some differences in how individuals behave when they make decisions alone compared to when they have to coordinate their decision with a second person. Next, we examine in more detail when such differences in behavior in joint versus individual decisions occur. We do so for both control and identity sessions, in order to understand whether these differences are simply driven by the fact that the decision is joint rather than individual, or whether they have to do with the effects of the social identities of the decision makers and the candidates.

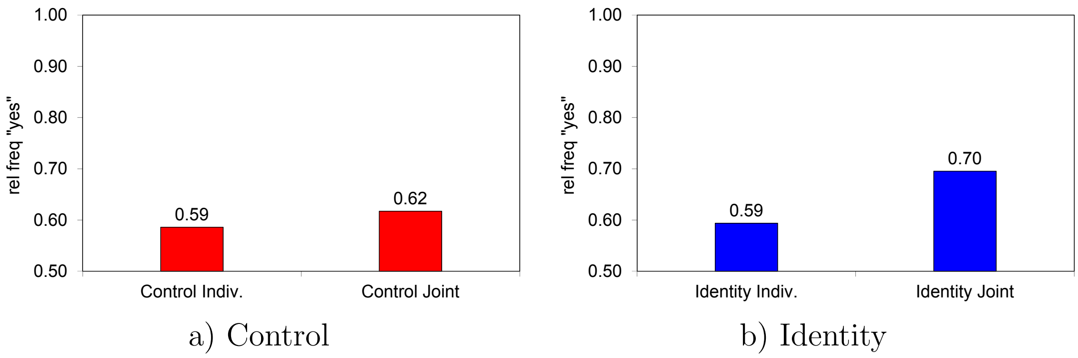


Figure 5: Joint versus Individual Decisions

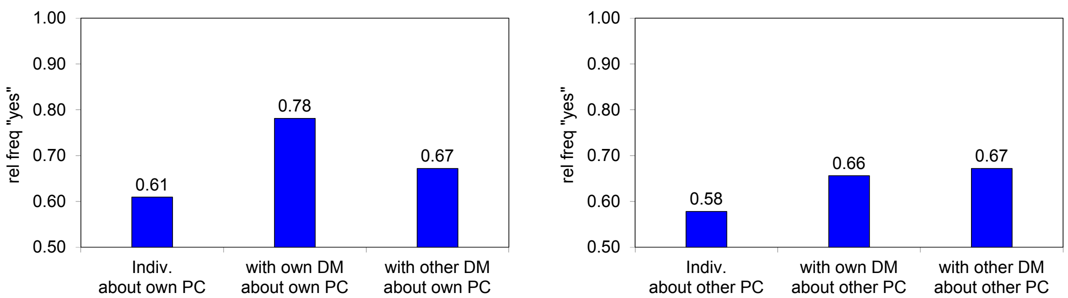
Figure 5a shows the average hiring rates in individual and in joint decision situations in control sessions. In control sessions the difference in hiring in joint versus individual decisions is 3 percentage points (0.62 versus 0.59) and not statistically significant. There is no difference in hiring rates in individual versus joint decisions in control sessions under parameter set 1 and there is slightly more hiring in joint than in individual decisions in control sessions under parameter set 2 (the difference is statistically significant but the effect is not large). Thus, the result that the difference in the hiring rate in joint versus individual decisions in control sessions is small is supported under each of the two parameter sets.

Result 4a: *In the absence of identity, there is little difference in individual* *hiring rates in joint compared to individual decisions.*

Figure 5b shows the difference in joint versus individual decisions in sessions with group identity. In identity sessions hiring in joint decisions is 11 percentage points higher than hiring in individual decisions (0.70 versus 0.59). This difference in hiring rates is substantial and statistically significant (at $\alpha = 0.10$). Thus, under the presence of group identity individual decision makers hire more candidates when deciding with another person compared to when deciding alone. In identity sessions, there is no difference in hiring rates in joint versus individual decisions under parameter set 1 but there is a substantial and significant difference in hiring rates (20 percentage points) in joint compared to individual decisions under parameter set 2.

Result 4b: *In the identity treatment decision makers hire substantially and significantly more candidates in joint than in individual decisions. This difference is entirely driven by more hiring in joint than in individual decisions under parameter set 2.*

Finally, to clarify further when differences in joint compared to individual decisions arise, we decompose the decisions in identity sessions according to the identities of the candidate and of the co-decision maker.



a) Decisions about Own Candidate b) Decisions about Other Candidate

Figure 6: Joint versus Individual Decisions by Candidate Type

As Figure 6a shows, individuals hire 17 percentage points more own group candidates when deciding with an own group decision maker than when deciding individually (0.78 versus 0.61, difference statistically significant at $\alpha = 0.10$). Individuals hire 6 percentage points more own group candidates when deciding with other group decision maker than when deciding individually (0.67 versus 0.61, not statistically significant). Figure 6b shows that there are also increases in the hiring of other group candidates in joint decisions, both with own and with other group decision makers, compared to individual decisions (8 percentage points and 9 percentage points, respectively), although these increases are not statistically significant.

Distinguishing by parameter set, individuals hire substantially more own group candidates when deciding with own group decision maker than when deciding individually under each of the two parameter sets. Under parameter set 2, individuals also hire substantially and significantly more other group candidates in joint than in individual decisions (both when deciding with own and with other group co-decision maker).

Result 4c: *In identity sessions decision makers hire on aggregate substantially and significantly more own group candidates in joint than in individual decisions. The difference is especially big when deciding with an own group decision maker. There is also more hiring of other group candidates in joint than in individual decisions, regardless of the identity of the co-decision maker. It is driven by more hiring of other group candidates in joint than in individual decisions under parameter set 2.*

6 Discussion

In this section we discuss the main empirical results of the paper, linking them to previous literature and to potential theoretical explanations. We begin by highlighting our three main findings. First, the data show that there is substantial and significant discrimination in individual decisions under parameter set 2. The hiring rate of own group candidates in individual decisions in identity sessions under parameter set 2 (0.69) is 22 percentage points higher than the hiring rate of other group candidates (0.47). This seems to be due mainly to negative discrimination against the other group.

Second, on aggregate we find also more hiring of own than of other group candidates in joint decisions. In particular, there is substantial and significant discrimination in joint decisions under parameter set 2. In this case, the difference in hiring rates of own and other group candidates is 12 percentage points. Discrimination in joint decisions takes the form of positive treatment of the own group rather than of negative treatment of the other group. Thus, the type of discrimination observed in joint decisions is different from the type of discrimination observed in individual decisions.

And third, a key finding in this study is that the configurations of the identities of the decision makers and the candidate in joint decisions matter a great deal. In particular, there is substantial discrimination in joint decisions with an own group decision maker, occurring under each of the two parameter sets. Overall, i.e. aggregating over the two parameter sets, in decisions with an own group decision maker individuals hire 78% of own group candidates, compared with only 66% of other group candidates. There is no substantive evidence of discrimination occurring when decisions are made with other group co-decision maker.

What is remarkable about these findings is that discrimination occurs in a controlled set-up in which own and other group candidates are identical in all else but their group identity. Moreover, when discrimination occurs the magnitude of the discriminatory effect is rather large, i.e. in the range of 10-20 percentage points difference in hiring of own and other group candidates. It should be noted that this is without any conflict of interest between the two groups and with identities induced through just working on a common problem. One could imagine that if there were conflicts of interest or if the groups involved had a long history of disagreement, the effect could be even stronger. This finding of differential treatment of the own and the other group in project assignment decisions lends empirical support to the idea that group identity may matter (Tajfel and Turner, 1979; Akerlof and Kranton, 2000) and adds to previous experimental studies on the role of social identity for the decisions that people make in other contexts (Brown, 2000; Chen and Chen, 2011; Chen and Li, 2009; Eckel and Grossman, 2005; Charness et al., 2007).

One question that arises in our experiment is why we find substantial and significant discrimination under one parameter set but not under the other. Although, as pointed out above, much of the experimental literature suggests that there are differences in treatment of own and other group members in many situations, there are also studies that do not find such effects in all cases, suggesting that the role of identity can be subtle and can depend on the exact situation considered (Ahmed, 2007; Gueth et al., 2008; Drouvelis and Nosenzo, 2013). What we observe in our experiment is that individuals hire significantly more own than other group candidates in the case when the expected payoff from hiring a candidate was slightly lower than the payoff from not hiring a candidate. One possible interpretation of the occurrence of negative discrimination towards other group candidates under parameter set 2 is that decision makers are less willing to take risk when other group candidates are involved than when own group candidates are involved.[14]

Our finding of discrimination in joint decisions when the two decision makers are of the same group adds to the findings of empirical studies based on non-experimental data that find biases in decisions related to the group identities of the members of a committee (Bagues and Esteve-Volart, 2010; Anwar et al., 2012; Zinovyeva and Bagues, 2011; Price and Wolfers, 2010). These studies have used observational data from contexts ranging from jury decisions in criminal courts to the decisions of examination committees in the Spanish judicial system to the decisions of a crew of basketball referees, to show that the configurations of group identities of a committee's members can lead to biases in decision making. Our experiment complements them in several ways. We take one element of committee decision making, the coordination motive, and conduct a study of how decision makers interested in coordinating their decisions may be affected by the identity of their co-decision maker. By necessity, in doing so we leave out many important aspects of real world committee decision making - e.g. communication, repeated interaction, power relations, etc. The benefit of doing so is that we are able to study and isolate the effect of group identity in joint decisions in a controlled setting. Additionally, by inducing group identities in the lab we also abstract from the tastes and stereotypes that may exist in favor of or against particular groups in society. By documenting the possibility that group identity affects decisions even in a controlled environment, we hope to contribute to the debate of whether the public could have reasons to be concerned about all members of a decision making body being of the same group (e.g. all black/white, all women/men). Our findings suggest that such concerns are not unwarranted even in a controlled setting and that it is therefore important to investigate the matter further in other environments.

We now discuss how our findings can be interpreted in terms of the theoretical literature on discrimination. Given that the design is balanced so that own and other group candidates have the same characteristics, the discrimination occurring in individual decisions seems in line with in-group bias as discussed by Social Identity Theory in psychology see Tajfel and Turner (1979). It is

[14] To the best of our knowledge the connection between willingness to take risk and in-group bias has not been investigated in the literature so far. An exception is the recent experiment by Currarini and Mengel (2013) which documents a correlation between risk aversion and homophily. The findings from both papers suggest that it could be an interesting direction for further research.

also consistent with Gary Becker's taste for discrimination model, in which an employer has tastes in favor of or against particular groups. Our experimental design allows us to distinguish whether the discrimination that manifests itself in the behavior of decision makers is due to a negative treatment of the other group or to a positive treatment in favor of the own group. We find that in individual decisions negative discrimination against the other group is prevalent.[15]

Decision makers discriminate in both some individual and in some joint decision making situations, but as highlighted above the type of discrimination observed is different. This suggests that decision makers may have different motives to discriminate in the two types of decision situations. In particular, in joint decisions decision makers have an incentive to coordinate their decisions with a co-decision maker. Thus, they have a strategic interest in considering what their co-decision maker will do or what their co-decision maker believes they will do and so on, including higher order beliefs.

The experimental findings are consistent with a situation in which decision makers exhibit negative discrimination against other group candidates in individual decisions but their expectations about behavior in the joint decision making case are that the co-decision maker will not negatively discriminate against the other group or that the co-decision maker does not expect them to negatively discriminate, etc. One reason this could be the case is that discrimination in the sense of treating members of the other group in a negative way is frowned upon in society and thus against the social norm and this is common knowledge among participants in the experiment. A related interpretation of the finding of positive discrimination of the own group in joint decisions is that it captures expectations of favoritism of the own group.

Note that distinguishing whether discrimination is due to positive treatment of the own group or to negative treatment of the other group may be difficult in non-controlled environments. Still, distinguishing between the two cases where possible is informative for two reasons. First, in the real world accusations of discrimination between members of the own and of the other group are often countered with the argument that one treats candidates of the other group

[15]Note that the set-up here is different from the one considered in statistical discrimination models, e.g. Arrow (1973); Coate and Loury (1993). In statistical discrimination models there is an employer, who faces workers from two groups and does not have information about the productivity characteristics of the individual worker, but has beliefs about the average productivity characteristics in a group. In our case, there is no incompleteness of information about productivity. Thus, different beliefs about the productivity of own and other group project candidates cannot explain discrimination here.

according to their ”objective” characteristics. As behavior in this experiment shows, this may be indeed true in some situations (e.g. in joint decisions there is no negative discrimination against other group candidates). However, positive and negative discrimination may be two sides of the same coin, and the existence of positive discrimination of the own group in joint decisions may be no less harmful in terms of long-run efficiency and fairness consequences. Furthermore, arguments have been made that while discrimination based on negative tastes is expected to disappear in the long run, discrimination based on positive tastes is expected to persist (Ahmed, 2007; Goldberg, 1982).[16]

Game-theoretically one can think of a particular configuration of group identities in the joint decision making case as a common public signal perceived by both decision makers. This public signal allows for the realization of correlated equilibria. Although the public signal may act as a coordination device, the signal is a priori uninformative as to which of these many equilibria to play.[17]

The public signal may, however, prompt beliefs in each decision maker regarding the expected behavior under that configuration of group identities, and it is these beliefs that constitute an essential difference with individual decisions. Thus, for example, when two decision makers of the same group try to coordinate on a decision regarding a candidate of their own group, they consider not only what they individually would prefer to do, but also what they expect the other to do, and what the other in turn expects them to do, and so on. Decision makers may, then, choose between hiring and not hiring in such situations depending on their beliefs about the strength of the social norm of favoritism of the own group, or about negative discrimination against the other group in the population. What our experimental analysis shows is that there are strong mutual expectations about the existence of a social norm of favoritism of the own group.

It should be highlighted here that although we are discussing the role of beliefs as a potential mechanism through which discrimination is channelled in joint decisions, this is again not in the sense of the statistical discrimination literature where an employer has incomplete information about the characteristics of the candidate and forms beliefs about them. Here the beliefs are about co-decision maker's behavior. Our story is thus reminiscent of Gary Becker's co-

[16]For distinguishing positive/negative discrimination in other contexts, see also Ahmed (2007) and Feld et al. (2013).

[17]Note that in each joint decision making situation in our experiment there are two pure strategy Nash equilibria (either both hiring or both not hiring), and that the presence of group identities as such does not make one of these equilibria more focal than the other.

worker discrimination in which an employer may negatively discriminate against a worker belonging to a group his other workers discriminate against even if the employer does not have a taste for discrimination (Becker, 1971). Note that in Becker the co-worker discrimination case is phrased as an individual decision making situation in which it is one employer who makes a decision, taking into account the tastes of workers. In our experiment, the joint decision making situation is symmetric. Two people make independent decisions about whether to assign a project to a candidate or not and have equal decision power. Other relevant theoretical explanations include the Akerlof (1976) and Peski and Szentes (2013) models, in which a person discriminates in spite of not having discriminatory tastes because this individual fears punishment in subsequent periods from other people in the community in case the social norm of discriminating is not obeyed. In both of these cases discrimination can result even in spite of an individual's tastes. The main difference between the situations considered in these models and the set-up in our experiment is that we consider a joint rather than an individual decision making situation. In our case, we do observe discrimination also in individual decisions, but the type of discrimination observed in joint decisions differs from the type of discrimination observed in individual decisions suggesting that beliefs about what the other person may do play a role. The model by Ramachandran and Rauh (2014) is close to our set-up in the sense that it considers a decision making situation in which two principals have equal decision making power about an agent and they make decisions independently of each other. The authors show that discriminatory behavior can persist in this set-up even if the principals do not have a taste for discrimination.

Our experiment complements the insights from these models and provides first empirical evidence in a controlled environment that the beliefs about what a co-decision maker will do influence the decisions an individual makes in a joint decision making situation, in which people have to coordinate decisions. That is, by comparing the behavior in individual and joint decisions, we document that in the two types of decision situations, different motives seem to play a role. Moreover, the identity of the co-decision maker in joint decisions affects the presence/absence of discriminatory behavior.

7 Concluding Remarks

This paper presented an experiment studying the role of social identity in individual and joint project assignment decisions. Our empirical findings document that substantial discrimination occurs in both types of decision situations. Moreover, the type of discrimination observed in individual decisions differs from the type of discrimination observed in joint decisions. Thus, the experiment suggests that anti-discrimination policy may have to be context sensitive, and that special attention should be paid to eradicating the acceptance of positive discrimination as a social norm in joint decision making situations.

By documenting the effect of the identity of the co-decision maker on the presence of discrimination in a controlled set-up this paper contributes to the public discussion on more diversity in committees, e.g. questions such as whether committees consisting of only men/only women or only white/only black members may make biased decisions. This study is not a substitute for studies on the role of group identity in committee decision making, but a complement to them, highlighting that if co-decision maker identity may play a role even in a controlled setting, with group identities induced in the lab, and without conflict of interest, concerns about all members of a decision making body belonging to the same group may not be unwarranted.

We believe that our findings underline the need for further studies to establish to what extent the observations that individuals behave differently in individual and in joint decision-making situations and that co-decision maker identity matters extend to other environments. Two potential directions for further research are the following. On the one hand, it would be interesting to conduct further controlled studies on differences in individual and joint decisions using social identities existing outside the lab such as gender, race, and religion. On the other hand, it would be beneficial to have a better understanding of the role of identities of committee members under alternative committee decision making rules, e.g. under unanimity versus majority voting.

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Appendix A. Tables

Decision Makers' Hiring Decisions

Table 2: DM's Hiring Decisions Aggregated over the Parameter Sets

Comparison 1 - Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
own PC	0.61	other PC	0.58	0.03	0.371	0.379	one

Comparison 2 - Individual Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	p-value regress.	tail
own PC Identity	0.61	Control	0.59	0.02	0.050	0.390	one
other PC Identity	0.58	Control	0.59	-0.01	0.094	0.469	one

Comparison 3 - Joint Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
own PC	0.73	other PC	0.66	0.07	0.156	0.122	one
own DM own PC	0.78	other DM own PC	0.67	0.11*/**	0.055	0.030	one
own DM own PC	0.78	own DM other PC	0.66	0.12*/**	0.063	0.013	one
other DM own PC	0.67	other DM other PC	0.67	0.00	-	1.000	two
own DM other PC	0.66	other DM other PC	0.67	-0.01	0.453	0.412	one

Comparison 4 - Joint Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	p-value regress.	tail
own PC Identity	0.73	Control	0.62	0.11**/**	1.782	0.029	one
other PC Identity	0.66	Control	0.62	0.04	0.966	0.830	one
own DM own PC	0.78	Control	0.62	0.16**/***	2.800	0.005	one
other DM own PC	0.67	Control	0.62	0.05	0.884	0.401	two
own DM other PC	0.66	Control	0.62	0.04	0.988	0.843	one
other DM other PC	0.67	Control	0.62	0.05	1.259	0.473	two

Comparison 5 - Joint vs Individual Decisions in Control Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
Joint	0.62	Indiv.	0.59	0.03	0.844	0.646	two

Comparison 6 - Joint vs Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
Joint	0.70	Indiv.	0.59	0.11*/**	0.066	0.015	two
Joint own PC	0.73	Indiv. own PC	0.61	0.12*/**	0.094	0.041	two
Joint other PC	0.66	Indiv. other PC	0.58	0.08	0.313	0.227	two
own DM own PC	0.78	Indiv. own PC	0.61	0.17*/**	0.078	0.029	two
other DM own PC	0.67	Indiv. own PC	0.61	0.06	0.3125	0.189	two
own DM other PC	0.66	Indiv. other PC	0.58	0.08	0.438	0.395	two
other DM other PC	0.67	Indiv. other PC	0.58	0.09	0.219	0.157	two

Notes. WSRT: Wilcoxon Signed Ranks Test; RROT: Robust Rank Order Test
p-value regress.: based on tests using the estimated regression coefficients
* significant at 10% level; ** at 5% level; *** at 1% level;
column 5: sign. based on column 6/column 7; one/two = one-/two-tailed tests

Table 3: DM's Hiring Decisions towards Candidates with Parameter Set 1

Comparison 1 - Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
own PC	0.53	other PC	0.69	-0.16	0.422	0.859	one

Comparison 2 - Individual Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	p-value regress.	tail
own PC Identity	0.53	Control	0.55	-0.02	-0.662	0.561	one
other PC Identity	0.69	Control	0.55	0.14	0.563	0.856	one

Comparison 3 - Joint Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
own PC	0.61	other PC	0.61	0.00	-	0.500	one
own DM own PC	0.72	other DM own PC	0.50	0.22*/**	0.055	0.031	one
own DM own PC	0.72	own DM other PC	0.59	0.13	0.168	0.153	one
other DM own PC	0.50	other DM other PC	0.63	-0.13	0.375	0.226	two
own DM other PC	0.59	other DM other PC	0.63	-0.04	0.438	0.402	one

Comparison 4 - Joint Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	p-value regress.	tail
own PC Identity	0.61	Control	0.55	0.06	0.407	0.257	one
other PC Identity	0.61	Control	0.55	0.06	0.786	0.772	one
own DM own PC	0.72	Control	0.55	0.17*/*	1.348	0.067	one
other DM own PC	0.50	Control	0.55	-0.05	-0.727	0.672	two
own DM other PC	0.59	Control	0.55	0.04	-0.053	0.681	one
other DM other PC	0.63	Control	0.55	0.08	0.783	0.480	two

Comparison 5 - Joint vs Individual Decisions in Control Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
Joint	0.55	Indiv.	0.55	0.00	-	1.000	two

Comparison 6 - Joint vs Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
Joint	0.61	Indiv.	0.61	0.00	-	1.000	two
Joint own PC	0.61	Indiv. own PC	0.53	0.08	0.297	0.380	two
Joint other PC	0.61	Indiv. other PC	0.69	-0.08	0.524	0.503	two
own DM own PC	0.72	Indiv. own PC	0.53	0.19	0.250	0.132	two
other DM own PC	0.50	Indiv. own PC	0.53	-0.03	0.875	0.725	two
own DM other PC	0.59	Indiv. other PC	0.69	-0.10	1.000	0.535	two
other DM other PC	0.63	Indiv. other PC	0.69	-0.06	0.688	0.587	two

Notes. WSRT: Wilcoxon Signed Ranks Test; RROT: Robust Rank Order Test
p-value regress.: based on tests using the estimated regression coefficients
* significant at 10% level; ** at 5% level; *** at 1% level;
column 5: sign. based on column 6/column 7; one/two = one-/two-tailed tests

Table 4: DM's Hiring Decisions towards Candidates with Parameter Set 2

Comparison 1 - Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
own PC	0.69	other PC	0.47	0.22*/**	0.074	0.021	one

Comparison 2 - Individual Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	p-value regress.	tail
own PC Identity	0.69	Control	0.63	0.06	0.593	0.282	one
other PC Identity	0.47	Control	0.63	-0.16/**	-0.857	0.049	one

Comparison 3 - Joint Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
own PC	0.84	other PC	0.72	0.12**/***	0.031	0.001	one
own DM own PC	0.84	other DM own PC	0.84	0.00	-	0.5	one
own DM own PC	0.84	own DM other PC	0.72	0.12*/**	0.094	0.028	one
other DM own PC	0.84	other DM other PC	0.72	0.12	0.375	0.226	two
own DM other PC	0.72	other DM other PC	0.72	0.00	-	0.5	one

Comparison 4 - Joint Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	p-value regress.	tail
own PC Identity	0.84	Control	0.69	0.15**/***	2.894	0.002	one
other PC Identity	0.72	Control	0.69	0.03	0.627	0.734	one
own DM own PC	0.84	Control	0.69	0.15***/***	4.126	0.001	one
other DM own PC	0.84	Control	0.69	0.15*	2.200	0.400	two
own DM other PC	0.72	Control	0.69	0.03	0.627	0.699	one
other DM other PC	0.72	Control	0.69	0.03	0.366	0.755	two

Comparison 5 - Joint vs Individual Decisions in Control Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
Joint	0.69	Indiv.	0.63	0.06*	0.063	0.240	two

Comparison 6 - Joint vs Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	p-value regress.	tail
Joint	0.78	Indiv.	0.58	0.20**/***	0.016	0.000	two
Joint own PC	0.84	Indiv. own PC	0.69	0.15/**	0.125	0.046	two
Joint other PC	0.72	Indiv. other PC	0.47	0.25**/***	0.020	0.000	two
own DM own PC	0.84	Indiv. own PC	0.69	0.17/*	0.156	0.057	two
other DM own PC	0.84	Indiv. own PC	0.69	0.17/*	0.156	0.057	two
own DM other PC	0.72	Indiv. other PC	0.47	0.25**/***	0.031	0.003	two
other DM other PC	0.72	Indiv. other PC	0.47	0.25*/**	0.078	0.020	two

Notes. WSRT: Wilcoxon Signed Ranks Test; RROT: Robust Rank Order Test
p-value regress.: based on tests using the estimated regression coefficients
* significant at 10% level; ** at 5% level; *** at 1% level;
column 5: sign. based on column 6/column 7; one/two = one-/two-tailed tests

Appendix B. Regression Analysis

In this Appendix we present regression analysis for the decision makers' hiring decisions and we show that it confirms the findings based on non-parametric statistical tests reported in the main text and in the tables in Appendix A. There are again four subsections, each focusing on one of the four questions we are interested in: First, is there discrimination in individual decisions? Second, is there discrimination in joint decisions? Third, does the identity of the co-decision maker matter for whether discrimination arises in joint decisions? Fourth, do decision makers behave differently in joint and in individual decisions?

Discrimination in Individual Decisions

Table 5: Discrimination in Individual Decisions

GLS Random Effects: dependent variable *hire*, control and identity sessions

	(1)	(2)
own PC	0.02	-0.02
	(0.08)	(0.10)
other PC	-0.01	0.14
	(0.10)	(0.13)
PS2		0.08
		(0.06)
own PC × *PS2*		0.08
		(0.13)
other PC × *PS2*		-0.30***
		(0.11)
constant	0.59***	0.55***
	(0.05)	(0.06)
observations	256	256
prob > chi2	0.94	0.05

Notes. * significant at 10% level; ** significant at 5% level; *** significant at 1% level with session random effects, robust standard errors clustered at the session level

In each case, we run the corresponding regressions and use the estimated regression coefficients to test the hypotheses presented in section 4 of the main text. The tests based on the estimated regression coefficients are Chi-squared tests of differences of two linear combinations of coefficients. In case of one-sided hypotheses tests we use the approximation to the standard normal distribution to derive the p-values.

In Table 5 we present regressions of the binary dependent variable *hire* on a number of explanatory variables, including all observations from individual decisions in both control and identity sessions. The equation for regression (1) in Table 5 is:

$$hire_i = \beta_0 + \beta_1 \; own \; PC_i + \beta_2 \; other \; PC_i + \epsilon_i \qquad (1)$$

where $own\ PC_i = 1$ if the candidate is of the own group and $own\ PC_i = 0$ if the candidate is of the other group and in control sessions; $other\ PC_i = 1$ if the candidate is of the other group and $other\ PC_i = 0$ if the candidate is of the own group and in control sessions. In Regression (1) in Table 5 the constant $\beta_0 = 0.59$ is equal to the hiring rate in individual decisions in control sessions. The hiring rate of own group candidates in individual decisions in identity sessions is given by $\beta_0 + \beta_1 = 0.61$. The hiring rate of other group candidates in individual decisions in identity sessions is $\beta_0 + \beta_2 = 0.58$. Note that these numbers correspond to the ones in Comparison 1 in Table 2 (Appendix A).

Regression specification (1) does not provide evidence that the group identity of the candidate affects hiring in individual decisions. The coefficient estimates for β_1 and β_2 are small and not statistically significant. Likewise, a test of $\beta_0 + \beta_1 = \beta_0 + \beta_2$ does not reveal any statistically significant difference between hiring of own and of other group candidates in identity sessions. However, the p-value for regression specification (1) indicates that we cannot reject the null hypothesis of no joint significance of the parameters. The equation for regression (2) in Table 5 is:

$$\begin{aligned} hire_i = \beta_0 + \beta_1 \; own \; PC_i + \beta_2 \; other \; PC_i + \beta_3 \; PS2_i \\ + \beta_4 \; own \; PC_i \times PS2_i + \beta_5 \; other \; PC_i \times PS2_i + \epsilon_i \end{aligned} \qquad (2)$$

In (2) we include the parameter set of the decision situation as an additional explanatory variable with $PS2_i = 1$ if the decision is under parameter set 2 and

$PS2_i = 0$ if it is under parameter set 1. By also including interaction terms, regression (2) allows for the effect of own (other) group identity on the hiring rate to depend on the parameter set. As Table 5 shows the estimated coefficient β_5 is large and statistically significant at the $\alpha = 0.01$ level. This is indicative of strong negative discrimination of other group candidates in individual decisions under parameter set 2. Using the coefficient estimates from this regression we find the same hiring rates as those in Comparisons 1 and 2 in Tables 3 and 4.

That is, using the coefficient estimates from regression (2) we find that the hiring rate of own group candidates under parameter set 2, $\beta_0 + \beta_1 + \beta_3 + \beta_4 = 0.69$ is significantly higher than the hiring rate of other group candidates under parameter set 2 (equal to $\beta_0 + \beta_2 + \beta_3 + \beta_5 = 0.47$). The difference of 22 percentage points is statistically significant at the $\alpha = 0.05$ level (p-value = 0.021, one-sided). A test on the difference between the hiring rate of other group candidates under PS2 (0.47) and the hiring rate of candidates under PS2 in control session ($\beta_0 + \beta_3 = 0.63$) shows that the difference of - 0.16 is also significant at the $\alpha = 0.05$ level (p-value = 0.049, one-sided). This is in line with the results from Comparisons 1 and 2 in Table 4 and supports *Result 1* (in the main text) of substantial and significant negative discrimination against other group candidates in individual decisions under parameter set 2. The coefficients estimated under regression (2) are jointly significant ($Prob > chi2 = 0.05$).

Discrimination in Joint Decisions

Table 6 above presents our results on discrimination in joint decisions. The equation for regression (3) is:

$$hire_i = \beta_0 + \beta_1 \; own \; PC_i + \beta_2 \; other \; PC_i + \epsilon_i \tag{3}$$

The hiring rate of candidates in control sessions estimated in (3) is $\beta_0 = 0.62$. The hiring rate of own group candidates in joint decisions in identity sessions is $\beta_0 + \beta_1 = 0.73$. The hiring rate of other group candidates in joint decisions in identity sessions is $\beta_0 + \beta_2 = 0.66$. These hiring rates are the same as those reported in Comparisons 3 and 4 in Table 2.

The coefficient β_1 in regression (3) is positive and statistically significant, indicating that the hiring rate of own group candidates in joint decisions in identity sessions is 11 percentage points higher than the hiring rate of candidates in joint decisions in control sessions (p-value = 0.029, one-sided). This is in line

Table 6: Discrimination in Joint Decisions

GLS Random Effects: dependent variable *hire*, control and identity sessions

	(3)	(4)
own PC	0.11*	0.06
	(0.06)	(0.10)
other PC	0.05	0.06
	(0.05)	(0.08)
PS2		0.14**
		(0.06)
own PC × *PS2*		0.09
		(0.10)
other PC × *PS2*		-0.03
		(0.10)
constant	0.62***	0.55***
	(0.03)	(0.06)
observations	384	384
prob > chi2	0.17	0.00

Notes. * significant at 10% level; ** significant at 5% level; *** significant at 1% level with session random effects, robust standard errors clustered at the session level

with strong positive discrimination in favor of the own group in joint decisions.

Regression (4) adds the parameter set as an explanatory variable and also includes interaction terms:

$$\begin{aligned} hire_i = \beta_0 + \beta_1 \; own\ PC_i + \beta_2 \; other\ PC_i + \beta_3 \; PS2_i \\ + \beta_4 \; own\ PC_i \times PS2_i + \beta_5 \; other\ PC_i \times PS2_i + \epsilon_i \end{aligned} \tag{4}$$

In regression (4) the estimated coefficient β_3 is statistically significant, indicating more hiring of candidates under parameter set 2 than under parameter set 1 in joint decisions. Using the coefficients from the regression, we find that the hiring rates of candidates under parameter set 1 and parameter set 2 in control sessions, and of own and of other group candidates under parameter set 1 and parameter set 2 in identity sessions correspond to those reported in Comparisons 3 and 4 in Tables 3 and 4. We find significant differences on the following two comparisons. In joint decisions under parameter set 2 the hiring rate of own group candidates $\beta_0 + \beta_1 + \beta_3 + \beta_4 = 0.84$ is substantially and significantly higher than that of other group candidates $\beta_0 + \beta_2 + \beta_3 + \beta_5 = 0.72$ (p-value

= 0.001, one-sided). Also under parameter set 2 the hiring rate of own group candidates in joint decisions in identity sessions $\beta_0 + \beta_1 + \beta_3 + \beta_4 = 0.84$ is substantially and significantly higher than the hiring rate of candidates in joint decisions in control sessions $\beta_0 + \beta_3 = 0.69$ (p-value = 0.002, one-sided). The analysis of the regressions in Table 6 thus confirms *Result 2* in the main text.

Co-Decision Maker Identity and Discrimination in Joint Decisions

Table 7: Co-Decision Maker Identity and Discrimination

GLS Random Effects: dependent variable *hire*, control and identity sessions

	(5)	(6)
own PC	0.05	-0.05
	(0.07)	(0.11)
other PC	0.05	0.08
	(0.08)	(0.11)
PS2		0.14**
		(0.06)
own DM	-0.02	-0.03
	(0.07)	(0.13)
own PC × *PS2*		0.20
		(0.13)
other PC × *PS2*		-0.05
		(0.14)
own PC × *own DM*	0.13	0.25*
	(0.09)	(0.15)
PS2 × *own DM*		0.03
		(0.21)
PS2 × *own PC* × *own DM*		-0.25
		(0.24)
constant	0.62***	0.55***
	(0.03)	(0.06)
observations	384	384
prob > chi2	0.12	0.00

Notes. * significant at 10% level; ** significant at 5% level; *** significant at 1% level with session random effects, robust standard errors clustered at the session level

We now look at the question whether discrimination arises in decisions with own (with other) group co-decision maker. The equation for regression (5) in

Table 7 is:

$$
\begin{aligned}
hire_i = {} & \beta_0 + \beta_1 \; own \; PC_i + \beta_2 \; other \; PC_i + \beta_3 \; own \; DM_i \\
& + \beta_4 \; own \; PC_i \times own \; DM_i + \epsilon_i
\end{aligned}
\tag{5}
$$

where $own\ DM_i = 1$ if the co-decision maker is from the own group and $own\ DM_i = 0$ if the co-decision maker is from the other group and in control sessions. All the hiring rates of candidates in joint decisions in control sessions, and of own and of other group candidates in joint decisions with own and with other group decision makers in identity sessions estimated on the basis of the regression coefficients from regression (5) correspond to those in Comparisons 3 and 4 in Table 2. Using the estimated coefficients, we find that the following differences are significant. The hiring rate of own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_3 + \beta_4 = 0.78$ is significantly higher than the hiring rate of own group candidates when deciding with other group co-decision maker $\beta_0 + \beta_1 = 0.67$ (p-value = 0.030, one-sided). The hiring rate of own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_3 + \beta_4 = 0.78$ is significantly higher than the hiring rate of other group candidates when deciding with own group co-decision maker $\beta_0 + \beta_2 + \beta_3 = 0.66$ (p-value = 0.013, one-sided). The hiring rate of own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_3 + \beta_4 = 0.78$ is significantly higher than the hiring rate of candidates in joint decisions in control sessions $\beta_0 = 0.62$ (p-value = 0.005, one-sided). The last two findings above indicate strong positive discrimination in favor of the own group in joint decisions with own group co-decision maker.

The equation for regression (6) is:

$$
\begin{aligned}
hire_i = {} & \beta_0 + \beta_1 \; own \; PC_i + \beta_2 \; other \; PC_i + \beta_3 \; PS2_i + \beta_4 \; own \; DM_i \\
& + \beta_5 \; own \; PC_i \times PS2_i + \beta_6 \; other \; PC_i \times PS2_i + \beta_7 \; own \; PC_i \times own \; DM_i \\
& + \beta_8 \; PS2_i \times own \; DM_i + \beta_9 \; PS2_i \times own \; PC_i \times own \; DM_i + \epsilon_i
\end{aligned}
\tag{6}
$$

In regression (6), the coefficient β_3 is statistically significant. So is the coefficient β_7 on the interaction term of own group candidate with own group decision maker. The hiring rates calculated using the coefficients from regression (6) are the same as those in Comparison 3 and Comparison 4 in Tables 3 and 4. Tests based on the coefficients reveal the following. Under parameter set 1 the hiring rate of own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_4 + \beta_7 = 0.72$ is substantially and significantly higher than the hiring rate of own group candidates when deciding with other group co-decision maker $\beta_0 + \beta_1 = 0.50$ (p-value = 0.031, one-sided). Under parameter set 1 the hiring rate of own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_4 + \beta_7 = 0.72$ is substantially and significantly higher than the hiring rate of candidates in joint decisions in control sessions $\beta_0 = 0.55$ (p-value = 0.067, one-sided).

Under parameter set 2 the hiring rate of own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_3 + \beta_4 + \beta_5 + \beta_7 + \beta_8 + \beta_9 = 0.84$ is substantially and significantly higher than the hiring rate of other group candidates when deciding with own group co-decision maker $\beta_0 + \beta_2 + \beta_3 + \beta_4 + \beta_6 + \beta_8 = 0.72$ (p-value = 0.028, one-sided). And again under parameter set 2 the hiring rate of own group candidate when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_3 + \beta_4 + \beta_5 + \beta_7 + \beta_8 + \beta_9 = 0.84$ is substantially and significantly higher than the hiring rate of candidates in joint decisions in control sessions $\beta_0 + \beta_3 = 0.69$ (p-value = 0.001, one-sided). These findings are in line with our *Results 3a* and *3b* in the paper.

Differences in Behavior in Joint versus Individual Decisions

The regressions in Table 8 test whether there are any differences in individual hiring rates in joint versus individual decisions in control sessions. The equations for the regressions in Table 8 are:

$$hire_i = \beta_0 + \beta_1 \; joint_i + \epsilon_i \tag{7}$$

$$\begin{aligned} hire_i = \beta_0 + \beta_1 \; joint_i + \beta_2 \; PS2_i \\ + \beta_3 \; joint_i \times PS2_i + \epsilon_i \end{aligned} \tag{8}$$

where $joint_i = 1$ if the decision is joint and $joint_i = 0$ if the decision is individual. Regressions (7) and (8) do not present significant evidence for a difference in hiring rates in joint versus individual decisions in control sessions, both when we do not and when we do control for the effect of the parameter set on the hiring rates. These results are in line with our findings in Comparison 3 in Tables 2, 3, and 4 and thus confirm our *Result 4a* in the text. Using the

Table 8: Differences Individual/Joint Decisions in Control Sessions

GLS Random Effects: dependent variable *hire*, control sessions

	(7)	(8)
joint	0.03	-0.00
	(0.07)	(0.10)
PS2		0.08
		(0.06)
joint × *PS2*		0.06
		(0.09)
constant	0.59***	0.55***
	(0.05)	(0.06)
observations	256	256
prob > chi2	0.65	0.02

Notes. * significant at 10% level; ** significant at 5% level; *** significant at 1% level with session random effects, robust standard errors clustered at the session level

coefficient estimates from regression (8), our tests comparing joint with individual decisions under parameter set 1 (parameter set 2, respectively), cannot reject the null hypothesis of no difference.

We now turn to differences in hiring in joint versus individual decisions in identity sessions. We conduct a series of regressions, progressively including more explanatory variables. The first set of regressions mirrors the regressions for the case of control sessions.

Thus, the equations for regressions (9) and (10) are:

$$hire_i = \beta_0 + \beta_1 \ joint_i + \epsilon_i \tag{9}$$

$$\begin{aligned} hire_i = \beta_0 &+ \beta_1 \ joint_i + \beta_2 \ PS2_i \\ &+ \beta_3 \ joint_i \times PS2_i + \epsilon_i \end{aligned} \tag{10}$$

The coefficient β_1 in regression (9) is positive and statistically significant, indicating that the hiring rate in joint decisions in identity sessions is 10

Table 9: Differences Individual/Joint Decisions in Identity Sessions

GLS Random Effects: dependent variable *hire*, identity sessions

	(9)	(10)
joint	0.10**	-0.00
	(0.04)	(0.06)
PS2		-0.03
		(0.07)
joint × *PS2*		0.20***
		(0.07)
constant	0.59***	0.61***
	(0.06)	(0.08)
observations	384	384
prob > Chi2	0.02	0.00

Notes. * significant at 10% level; ** significant at 5% level; *** significant at 1% level with session random effects, robust standard errors clustered at the session level

percentage points higher than the hiring rate in individual decisions in identity sessions. This is in line with Comparison 6 in Table 2.

Regression (10) includes also the parameter set and interaction terms. It shows that if we allow for the effect of individual versus joint decision to depend on the parameter set by including an interaction term, we find that the increase in hiring in joint decisions in identity session occurs only under parameter set 2, but not under parameter set 1. A test of the difference in hiring rates in joint ($\beta_0 + \beta_1 + \beta_2 + \beta_3 = 0.78$) versus individual ($\beta_0 + \beta_2 = 0.58$) decisions under parameter set 2 in identity sessions shows that the difference of 0.20 is significant (Prob > Chi2 = 0.000). This is in line with the effect that we find in Comparison 6 in Table 3. Thus, our findings from the regression analysis of the differences between individual and joint decisions in identity sessions confirm *Result 4b* in the main text.

We now also include the identity of the candidate to test whether there are differences in joint versus individual decisions towards own (towards other) group candidates in identity sessions. The equation for regression (11) in Table 10 is:

$$\begin{aligned} hire_i = \beta_0 + \beta_1\ joint_i + \beta_2\ own\ PC_i \\ + \beta_3\ joint_i \times own\ PC_i + \epsilon_i \end{aligned} \tag{11}$$

Table 10: Differences Individual/Joint Decisions, incl. PC Identity

GLS Random Effects: dependent variable *hire*, identity sessions

	(11)	(12)
joint	0.09	-0.08
	(0.07)	(0.12)
own PC	0.03	-0.16
	(0.11)	(0.15)
PS2		-0.22**
		(0.10)
joint × *own PC*	0.03	0.16
	(0.10)	(0.17)
joint × *PS2*		0.33***
		(0.13)
own × *PS2*		0.38**
		(0.16)
joint × *own* × *PS2*		-0.25
		(0.21)
constant	0.58***	0.69***
	(0.09)	(0.12)
observations	384	384
prob > chi2	0.08	0.00

Notes. * significant at 10% level; ** significant at 5% level; *** significant at 1% level with session random effects, robust standard errors clustered at the session level

When using the coefficients from regression (11) to compare the hiring rate of own group candidates in joint decisions ($\beta_0 + \beta_1 + \beta_2 + \beta_3 = 0.73$) with the hiring rate of own group candidates in individual decisions ($\beta_0 + \beta_2 = 0.61$), the difference is statistically significant (Prob > Chi2 = 0.0412). The difference in hiring rates of other group candidates in joint ($\beta_0 + \beta_1 = 0.66$) and in individual decisions ($\beta_0 = 0.58$) is not statistically significant. These findings are in line with Comparison 6 in Table 2. The next regression also includes the parameter set as an explanatory variable and allows for interactions. The equation for regression (12) is:

$$
\begin{aligned}
hire_i = {} & \beta_0 + \beta_1 \; joint_i + \beta_2 \; own \; PC_i + \beta_3 \; PS2_i \\
& + \beta_4 \; joint_i \times own \; PC_i + \beta_5 \; joint_i \times PS2_i + \beta_6 \; own \; PC_i \times PS2_i \\
& + \beta_7 \; joint_i \times own \; PC_i \times PS2_i + \epsilon_i
\end{aligned} \tag{12}
$$

The coefficient β_3 is negative and statistically significant indicating less hiring of candidates under PS_2 than under PS_1. The coefficient β_5 is positive and statistically significant indicating more hiring of candidates under PS_2 in joint decisions. The coefficient β_6 indicates more hiring of own group candidates under PS_2. Comparing the hiring rate of other group candidates under parameter set 2 in joint decisions ($\beta_0 + \beta_1 + \beta_3 + \beta_5 = 0.72$) with the hiring rate of other group candidates under parameter set 2 in individual decisions ($\beta_0 + \beta_3 = 0.47$), we find that the difference is statistically significant (Prob > Chi2 = 0.000). The difference in hiring rate of own group candidates under parameter set 2 in joint decisions ($\beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \beta_6 + \beta_7 = 0.84$) and in individual decisions ($\beta_0 + \beta_2 + \beta_3 + \beta_6 = 0.69$) is also statistically significant (Prob > Chi2 = 0.046). This confirms our findings in Comparison 6 in Table 4.

Finally, we look at the differences between individual and joint decisions in identity sessions, taking into account the identity of the co-decision maker in joint decisions. The equation for regression (13) is:

$$
\begin{aligned}
hire_i = {} & \beta_0 + \beta_1 \; own \; PC_i + \beta_2 \; own \; DM_i + \beta_3 \; other \; DM_i \\
& + \beta_4 \; own \; PC_i \times own \; DM_i + \beta_5 \; other \; PC_i \times other \; DM_i + \epsilon_i
\end{aligned} \tag{13}
$$

None of the coefficients is statistically significant. An individual hires more own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_2 + \beta_4 = 0.78$ than in individual decisions $\beta_0 + \beta_1 = 0.61$ (Prob > chi2 = 0.029). This is in line with Comparison 3 in Table 2.

Regression (14) also includes the parameter set as an explanatory variable

Table 11: Differences Individual/Joint Decisions, incl. co-DM Identity

GLS Random Effects: dependent variable *hire*, identity sessions

	(13)	(14)
own PC	0.03	-0.16
	(0.11)	(0.15)
own DM	0.08	-0.09
	(0.09)	(0.15)
other DM	0.06	-0.03
	(0.05)	(0.09)
PS2		-0.22**
		(0.10)
own PC × *own DM*	0.09	0.28
	(0.13)	(0.22)
other PC × *other DM*	0.03	-0.03
	(0.07)	(0.15)
own PC × *PS2*		0.38**
		(0.16)
own DM × *PS2*		0.34**
		(0.16)
other DM × *PS2*		0.19
		(0.14)
own PC × *own DM* × *PS2*		-0.38*
		(0.22)
other PC × *other DM* × *PS2*		0.13
		(0.27)
constant	0.58***	0.69***
	(0.09)	(0.12)
observations	384	384
prob > chi2	0.00	-

Notes. * significant at 10% level; ** significant at 5% level; *** significant at 1% level with session random effects, robust standard errors clustered at the session level

and interaction terms. The equation is:

$$\begin{aligned} hire_i = {} & \beta_0 + \beta_1 own\ PC_i + \beta_2\ own\ DM_i + \beta_3\ other\ DM_i + \beta_4\ PS2_i \\ & + \beta_5\ own\ PC_i \times own\ DM_i + \beta_6\ other\ PC_i \times other\ DM_i \\ & + \beta_7\ own\ PC_i \times PS2_i + \beta_8\ own\ DM_i \times PS2_i \\ & + \beta_9\ other\ DM_i \times PS2_i + \beta_{10}\ own\ PC_i \times own\ DM_i \times PS2_i \\ & + \beta_{11}\ other\ PC_i \times other\ DM_i \times\ PS2_i + \epsilon_i \end{aligned} \tag{14}$$

The hiring rates estimated on the basis of the coefficients from regression

(14) are the same as those in Comparison 5 in Tables 3 and 4. The following differences are significant. Under parameter set 2 individuals hire more other group candidates when deciding with other group co-decision maker $\beta_0 + \beta_3 + \beta_4 + \beta_6 + \beta_9 + \beta_{11} = 0.72$ than when deciding individually $\beta_0 + \beta_4 = 0.47$ (Prob $>$ chi2 $= 0.020$). Under parameter set 2 individuals hire more other group candidates when deciding with own group co-decision maker $\beta_0 + \beta_2 + \beta_4 + \beta_8 = 0.72$ than when deciding individually $\beta_0 + \beta_4 = 0.47$ (Prob $>$ Chi2 $= 0.003$). Under parameter set 2 individuals hire more own group candidates when deciding with other group co-decision maker $\beta_0 + \beta_1 + \beta_3 + \beta_4 + \beta_7 + \beta_9 = 0.84$ than when deciding individually $\beta_0 + \beta_1 + \beta_4 + \beta_7 = 0.69$ (Prob $>$ Chi2 $= 0.057$). And under parameter set 2 individuals hire more own group candidates when deciding with own group co-decision maker $\beta_0 + \beta_1 + \beta_2 + \beta_4 + \beta_5 + \beta_7 + \beta_8 + \beta_{10} = 0.84$ than when deciding individually $\beta_0 + \beta_1 + \beta_4 + \beta_7 = 0.69$ (Prob $>$ Chi2 $= 0.0572$). The results related to Tables 10 and 11 support our *Result 4c* in the main text.

Appendix C. Candidates' Beliefs

The candidates in the experiment were given questions about their beliefs on decision makers' behavior. Below we present a table with our analysis of the candidates' beliefs. The design is balanced so half the candidates were asked what a decision maker of the own group would do and the other half were asked what a decision maker of the other group would do in a given situation. As the number of candidates in the experiment was half the number of the decision makers, the results on the candidates' beliefs are based on a relatively small sample size. We nevertheless conducted the same non-parametric statistical tests of significance on the candidates beliefs as on decision makers' behavior, aggregating over the two sets of parameters and aggregating over beliefs about own and other group decision makers. The results are presented in Table 12. The following differences are significant. We find that project candidates expect significantly more hiring of own group candidates in joint decisions in identity sessions (0.66) than in joint decisions in control sessions (0.52) (difference statistically significant at $\alpha = 0.05$). And in particular they expect more hiring of own group candidates in joint decisions with own group decision maker 0.69 than of candidates in joint decisions in control sessions 0.52 (difference statistically significant at $\alpha = 0.05$). Thus, the candidates' beliefs are in line with expectations of strong and positive own group favoritism in joint decisions. And this is in line with decision makers' behavior (see *Result 3* in the main text).

Table 12: Candidates' Beliefs on Hiring Decisions

Comparison 1 - Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	tail
own PC	0.69	other PC	0.63	0.06	0.313	one

Comparison 2 - Individual Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	tail
own PC Identity	0.69	Control	0.72	-0.03	-0.561	one
other PC Identity	0.63	Control	0.72	-0.09	-0.944	one

Comparison 3 - Joint Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	tail
own PC	0.66	other PC	0.56	0.10	0.188	one
own DM own PC	0.69	other DM own PC	0.63	0.06	0.313	one
own DM own PC	0.69	own DM other PC	0.56	0.13	0.125	one
other DM own PC	0.63	other DM other PC	0.56	0.07	0.625	two
own DM other PC	0.56	other DM other PC	0.56	0.00	-	one

Comparison 4 - Joint Decisions in Identity vs Control Sessions

situation	hiring rate	situation	hiring rate	Difference	RROT U	tail
own PC Identity	0.66	Control	0.52	0.14**	2.104	one
other PC Identity	0.56	Control	0.52	0.04	0.413	one
own DM own PC	0.69	Control	0.52	0.17**	2.276	one
other DM own PC	0.63	Control	0.52	0.11	1.200	two
own DM other PC	0.56	Control	0.52	0.04	0.916	one
other DM other PC	0.56	Control	0.52	0.04	0.625	two

Comparison 5 - Joint vs Individual Decisions in Control Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	tail
Joint	0.52	Indiv.	0.72	-0.20*	0.078	two

Comparison 6 - Joint vs Individual Decisions in Identity Sessions

situation	hiring rate	situation	hiring rate	Difference	p-value WSRT	tail
Joint	0.61	Indiv.	0.66	-0.05	0.313	two
Joint own PC	0.66	Indiv. own PC	0.69	-0.03	-	two
Joint other PC	0.56	Indiv. other PC	0.63	-0.07	0.438	two
own DM own PC	0.69	Indiv. own PC	0.69	0.00	-	two
other DM own PC	0.63	Indiv. own PC	0.69	-0.06	-	two
own DM other PC	0.56	Indiv. other PC	0.63	-0.07	0.563	two
other DM other PC	0.56	Indiv. other PC	0.63	-0.07	0.5	two

Notes. WSRT: Wilcoxon Signed Ranks Test; RROT: Robust Rank Order Test;
* significant at 10% level; ** significant at 5% level; one/two = one-/two-tailed tests
'-' insufficient number of observations for statistical testing

Appendix D. Experimental Instructions

[GENERAL INSTRUCTIONS CONTROL SESSIONS]

All participants in this session have the following identical instructions.

Introduction

Welcome to this experimental session and thank you for participating. The instructions for this experiment are simple and if you pay attention you can gain some money that will be paid to you in cash at the end of the session. From now on till the end of this experimental session you may not communicate with each other, unless explicitly told by the experimenter you may do so. If you have a question simply raise your hand and an experimenter will come to help you individually and in private. Ask your questions quietly. Make sure that all mobile phones are switched off and placed away. It is very important that you follow these rules, otherwise we will exclude you from the experiment and from all payments.

Instructions

We will now describe the experiment. In it you will be asked to make a number of decisions. For each decision, you will be randomly and anonymously matched with one or two other participants. You will never know whom you are matched with and they will never know who you are. There will be two types of decision situations. We will give an example of each and ask you some control questions only to make sure that you have understood the decision-making situations correctly before proceeding.

1) Situations in which **one decision-maker** makes a decision about a project candidate as in Example 1 below:

Example 1
There is a decision-maker. (S)he has a budget of £1.23. (S)he faces a randomly selected project candidate. (S)he has to decide whether to assign a project to this candidate or not.

- If (s)he decides to assign the project to the candidate, then the project will be assigned to the candidate. In that case the decision-maker pays the candidate £1.23 for his/her services. The decision-maker does not know in advance whether the candidate will complete the project successfully or not, but (s)he knows that chances of success are 40 in 100. If the project is completed successfully, the decision-maker will get £2.00. If the project is not completed successfully, the decision-maker will get £0.50.
- If (s)he decides not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case the decision-maker simply keeps the £1.23 for him/herself.

Please, answer the following control questions after carefully reading the above example. These questions are designed only to check that you have understood the decision situation before proceeding to the decision-making stage. The payoffs indicated in the examples are to check your understanding only. They are not relevant for payment.

Control Questions on Example 1

1) What is the number of decision-makers in this example? …..

2) What is the budget of the decision-maker? …..

3) How much will the decision-maker have to pay the project candidate if the decision-maker assigns the project to him/her? …..

4) What are the chances that the project is completed successfully? …..

5) How much will the decision-maker get if the project is completed successfully? .....

6) How much will the decision-maker get if the project is not completed successfully?

7) How much will the decision-maker keep for him/herself if the decision-maker does not assign the project to the project candidate? …..

8) How much will the project candidate get if the decision-maker assigns the project to him/her? …..

9) How much will the project candidate get if the decision-maker does not assign the project to him/her? …..

When you are ready with your answers, please raise your hand.

2) Situations in which **two decision-makers**, who decide independently of each other make decisions about a project candidate as in Example 2 below:

> **Example 2**
> There is a decision-maker. (S)he is randomly paired with another decision-maker. Each of them has a budget of £1.23. The two decision-makers face a randomly selected project candidate. Each of the two decision-makers has to decide independently whether to assign a project to this candidate or not.
> - If both decision-makers decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of the two decision-makers pays the candidate £1.23 for his/her services. The decision-makers do not know in advance whether the candidate will complete the project successfully or not, but each of them knows that chances of success are 30 in 100. If the project is completed successfully, each of the two decision-makers will get £3.60. If the project is not completed successfully, each of the two decision-makers will get £0.40.
> - If both decision-makers decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of the two decision-makers simply keeps the £1.23 for him/herself.
> - **If the two decision-makers make different decisions, no project assignment decision can be implemented and their disagreement will cost each of them £1.00 (to be deducted from each decision-maker's budget of £1.23).**

Control Questions on Example 2

10) What is the number of decision-makers in this example? …..

11) What is the budget of each decision-maker? …..

12) How much will each decision-maker have to pay to the project candidate in case the project is assigned to the candidate? …..

13) What are the chances that the project is completed successfully? …..

14) How much will each decision-maker get in case the project is completed successfully? …..

15) And in case the project is not completed successfully? …..

16) How much will each decision-maker keep for him/herself if both decision-makers do not assign the project to the candidate? …..

17) How much will each decision-maker have to pay out of his/her budget in case of disagreement with the other? …..

18) How much will the project candidate get if both decision-makers assign the project to him/her? …..

19) How much will the project candidate get if both decision-makers do not assign the project to him/her? …..

20) How many decision-makers have to make the decision to assign the project to the candidate for the project to be assigned? 1 or 2? …..

21) How much will the project candidate get if one decision-maker assigns the project to him/her, but the other decision-maker does not? …..

When you are ready with your answers, please raise your hand.

We are now ready to proceed to the next stage, which will consist of four project assignment questions that have a similar structure as the examples just considered. Some of you will be randomly assigned the role of **decision-makers** and others will be randomly assigned the role of **project candidates**. You will be given your role on the next handout and will keep it until the end of the experiment. You must keep your role confidential.

In each decision-making question you will be randomly and anonymously matched with one or two other participants. You will never know whom you are matched with and they will never know who you are. Your payoff from each question will be calculated at the end of the experimental session based on your decisions and on the decisions of the people you were matched with. All relevant payoff information for each question will be given in the following sheets. All payoffs are in pounds sterling (GBP).

Whenever we need to determine whether a project is successful or not, a draw will be made out of a bag, containing red and black chips. The number of red and black chips in the bag will correspond to the chances that a project is successful versus unsuccessful given in the respective question. If a red chip is drawn, the project is successful. If a black chip is drawn, the project is not successful. In many cases when a draw needs to be made, there will be more than one person affected by this draw. Only one of these people will make the draw when payments are being calculated and its outcome will be used for payment to the others affected.

Your total payoff will be calculated at the end of the experimental session and will be the sum of your payoffs from all decisions made on the next two pages plus the participation bonus of £3. You will be paid in private. You will not be told the answers and the payoffs of the other participants and they will not be told yours.

All questions <u>must be answered</u> by writing either “**yes**” **or** “**no**” in the answer field provided.

Do you have any questions?

[DECISION MAKER CONTROL SESSIONS]

<u>You are a decision-maker. This is your role for all remaining questions.</u>

Question 1
You are a decision-maker. You have a budget of £3.42. You face a randomly selected project candidate. You have to decide whether to assign a project to this candidate or not.

- If you decide <u>to assign</u> the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 45 in 100. If the project is completed successfully, you will get £6.20. If the project is not completed successfully, you will get £0.60.
- If you decide <u>not to assign</u> the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 2
You are a decision-maker. You have a budget of £3.42. You face a randomly selected project candidate. You have to decide whether to assign a project to this candidate or not.

- If you decide <u>to assign</u> the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 35 in 100. If the project is completed successfully, you will get £9.70. If the project is not completed successfully, you will get £0.50.
- If you decide <u>not to assign</u> the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 3

You are a decision-maker. You are randomly paired with another decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 35 in 100. If the project is completed successfully, you and the other decision-maker will each get £9.70. If the project is not completed successfully, you and the other decision-maker will each get £0.50.
- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 4

You are a decision-maker. You are randomly paired with another decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 45 in 100. If the project is completed successfully, you and the other decision-maker will each get £6.20. If the project is not completed successfully, you and the other decision-maker will each get £0.60.
- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

[PROJECT CANDIDATE CONTROL SESSIONS]

You are a project candidate. This is your role for all remaining questions.

In the boxes in small print you see the questions as given to decision-makers. In each answer slot provided, please answer whether you think the decision-maker will assign the project to the project candidate or not. The decision of the decision-maker may be about you in some questions, but it will not be about you in all questions. **For each correct answer you will get £3.**

Question as seen by decision-maker

> You are a decision-maker. You have a budget of £3.42. You face a randomly selected project candidate. You have to decide whether to assign a project to this candidate or not.
> - If you decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 45 in 100. If the project is completed successfully, you will get £6.20. If the project is not completed successfully, you will get £0.60.
> - If you decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.

Question 1: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

> You are a decision-maker. You have a budget of £3.42. You face a randomly selected project candidate. You have to decide whether to assign a project to this candidate or not.
> - If you decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 35 in 100. If the project is completed successfully, you will get £9.70. If the project is not completed successfully, you will get £0.50.
> - If you decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.

Question 2: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

> You are a decision-maker. You are randomly paired with another decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.
>
> - If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 45 in 100. If the project is completed successfully, you and the other decision-maker will each get £6.20. If the project is not completed successfully, you and the other decision-maker will each get £0.60.
> - If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
> - **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Question 3: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

> You are a decision-maker. You are randomly paired with another decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.
>
> - If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 35 in 100. If the project is completed successfully, you and the other decision-maker will each get £9.70. If the project is not completed successfully, you and the other decision-maker will each get £0.50.
> - If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
> - **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Question 4: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

[GENERAL INSTRUCTIONS IDENTITY SESSIONS]

All participants in this session have the following identical instructions.

Introduction

Welcome to this experimental session and thank you for participating. The instructions for this experiment are simple and if you pay attention you can gain some money that will be paid to you in cash at the end of the session. From now on till the end of this experimental session you may not communicate with each other, unless explicitly told by the experimenter you may do so. If you have a question simply raise your hand and an experimenter will come to help you individually and in private. Ask your questions quietly. Make sure that all mobile phones are switched off and placed away. It is very important that you follow these rules, otherwise we will exclude you from the experiment and from all payments.

Before the experiment started everyone drew an envelope which contained either a Green or a Blue paper. You have been assigned to the Green Group if you received a Green paper or to the Blue Group if you received a Blue paper. Your group assignment will remain the same throughout the experiment. That is, if you drew a Green paper, you will be in the Green Group for the rest of the experiment, and if you drew a Blue paper, you will be in the Blue Group for the rest of the experiment.

The experiment consists of two parts. We will start with Part 1. After Part 1 has finished we will give you instructions for Part 2.

Part 1. Instructions

Your group will be given eight paintings by two artists. You will have five minutes to study these paintings. Then you will be asked to identify the artist of four other paintings. Each correct answer will give you £2.00. You are strongly encouraged to discuss the paintings with your group members and get help from them or help them when answering the questions.

Do you have any questions?

Part 1. Your Answers. Each correct answer will give you £2.00.
(Please, specify Artist 1 or Artist 2 in each case.)

Answer 1: Painting 1 is by ……………………………………………………

Answer 2: Painting 2 is by ……………………………………………………

Answer 3: Painting 3 is by ……………………………………………………

Answer 4: Painting 4 is by ……………………………………………………

Part 2. Instructions

We will now describe Part 2. In it you will be asked to make a number of decisions. For each decision, you will be randomly and anonymously matched with one or two other participants. You will never know whom you are matched with and they will never know who you are. There will be two types of decision situations. We will give an example of each and ask you some control questions only to make sure that you have understood the decision-making situations correctly before proceeding.

1) Situations in which **one decision-maker** makes a decision about a project candidate as in Example 1 below:

> **Example 1**
> There is a decision-maker. (S)he has a budget of £1.23. (S)he faces a randomly selected project candidate. (S)he has to decide whether to assign a project to this candidate or not.
>
> - If (s)he decides not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case the decision-maker simply keeps the £1.23 for him/herself.
> - If (s)he decides to assign the project to the candidate, then the project will be assigned to the candidate. In that case the decision-maker pays the candidate £1.23 for his/her services. The decision-maker does not know in advance whether the candidate will complete the project successfully or not, but (s)he knows that chances of success are 40 in 100. If the project is completed successfully, the decision-maker will get £2.00. If the project is not completed successfully, the decision-maker will get £0.50.

Please, answer the following control questions after carefully reading the above example. These questions are designed only to check that you have understood the decision situation before proceeding to the decision-making stage. The payoffs indicated in the examples are to check your understanding only. They are not relevant for payment.

Control Questions on Example 1

1) What is the number of decision-makers in this example? …..

2) What is the budget of the decision-maker? …..

3) How much will the decision-maker keep for him/herself if the decision-maker does not assign the project to the project candidate? …..

4) How much will the decision-maker have to pay the project candidate if the decision-maker assigns the project to him/her? …..

5) What are the chances that the project is completed successfully? …..

6) How much will the decision-maker get if the project is completed successfully? .....

7) How much will the decision-maker get if the project is not completed successfully?

8) How much will the project candidate get if the decision-maker does not assign the project to him/her? …..

9) How much will the project candidate get if the decision-maker assigns the project to him/her? …..

When you are ready with your answers, please raise your hand.

2) Situations in which **<u>two decision-makers</u>**, who decide independently of each other make decisions about a project candidate as in Example 2 below:

Example 2
There is a decision-maker. (S)he is randomly paired with another decision-maker. Each of them has a budget of £1.23. The two decision-makers face a randomly selected project candidate. Each of the two decision-makers has to decide independently whether to assign a project to this candidate or not.

- If <u>both</u> decision-makers decide <u>not to assign</u> the project to the candidate, then the project will not be assigned to the candidate. In that case each of the two decision-makers simply keeps the £1.23 for him/herself.
- If <u>both</u> decision-makers decide <u>to assign</u> the project to the candidate, then the project will be assigned to the candidate. In that case each of the two decision-makers pays the candidate £1.23 for his/her services. The decision-makers do not know in advance whether the candidate will complete the project successfully or not, but each of them knows that chances of success are 30 in 100. If the project is completed successfully, each of the two decision-makers will get £3.60. If the project is not completed successfully, each of the two decision-makers will get £0.40.
- **If the two decision-makers <u>make different decisions</u>, no project assignment decision can be implemented and their disagreement will cost each of them £1.00 (to be deducted from each decision-maker's budget of £1.23).**

Control Questions on Example 2

10) What is the number of decision-makers in this example? …..

11) What is the budget of each decision-maker? …..

12) How much will each decision-maker keep for him/herself if both decision-makers do not assign the project to the candidate? …..

13) How much will each decision-maker have to pay to the project candidate in case the project is assigned to the candidate? …..

14) What are the chances that the project is completed successfully? …..

15) How much will each decision-maker get in case the project is completed successfully? …..

16) And in case the project is not completed successfully? …..

17) How much will each decision-maker have to pay out of his/her budget in case of disagreement with the other? …..

18) How much will the project candidate get if both decision-makers do not assign the project to him/her? …..

19) How much will the project candidate get if both decision-makers assign the project to him/her? …..

20) How many decision-makers have to make the decision to assign the project to the candidate for the project to be assigned? 1 or 2? …..

21) How much will the project candidate get if one decision-maker assigns the project to him/her, but the other decision-maker does not? …..

When you are ready with your answers, please raise your hand.

We are now ready to proceed to the next stage, which will consist of six project assignment questions that have a similar structure as the examples just considered. Some of you will be randomly assigned the role of **decision-makers** and others will be randomly assigned the role of **project candidates**. You will be given your role on the next handout and will keep it until the end of the experiment. You must keep your role confidential.

In each decision-making question you will be randomly and anonymously matched with one or two other participants. You will never know whom you are matched with and they will never know who you are. Your payoff from each question will be calculated at the end of the experimental session based on your decisions and on the decisions of the people you were matched with. All relevant payoff information for each question will be given in the following sheets. All payoffs are in pounds sterling (GBP).

Whenever we need to determine whether a project is successful or not, a draw will be made out of a bag, containing red and black chips. The number of red and black chips in the bag will correspond to the chances that a project is successful versus unsuccessful given in the respective question. If a red chip is drawn, the project is successful. If a black chip is drawn, the project is not successful. In many cases when a draw needs to be made, there will be more than one person affected by this draw. Only one of these people will make the draw when payments are being calculated and its outcome will be used for payment to the others affected.

Your total payoff will be calculated at the end of the experimental session and will be the sum of your payoffs from all decisions made in Part 1 plus from all decisions made on the next three pages plus the participation bonus of £3. You will be paid in private. You will not be told the answers and the payoffs of the other participants and they will not be told yours.

All questions <u>must be answered</u> by writing either “**yes**” **or** “**no**” in the answer field provided.

Do you have any questions?

[DECISION MAKER IDENTITY SESSIONS]

<u>You are a GREEN decision-maker. This is your role for all remaining questions.</u>

Question 1
You are a **GREEN** decision-maker. You have a budget of £3.42. You face a randomly selected **BLUE** project candidate. You have to decide whether to assign a project to this candidate or not.

- If you decide <u>not to assign</u> the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.
- If you decide <u>to assign</u> the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 35 in 100. If the project is completed successfully, you will get £9.70. If the project is not completed successfully, you will get £0.50.

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 2
You are a **GREEN** decision-maker. You have a budget of £3.42. You face a randomly selected **GREEN** project candidate. You have to decide whether to assign a project to this candidate or not.

- If you decide <u>not to assign</u> the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.
- If you decide <u>to assign</u> the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 45 in 100. If the project is completed successfully, you will get £6.20. If the project is not completed successfully, you will get £0.60.

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 3
You are a **GREEN** decision-maker. You are randomly paired with another **GREEN** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **BLUE** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 35 in 100. If the project is completed successfully, you and the other decision-maker will each get £9.70. If the project is not completed successfully, you and the other decision-maker will each get £0.50.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 4
You are a **GREEN** decision-maker. You are randomly paired with a **BLUE** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **GREEN** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 45 in 100. If the project is completed successfully, you and the other decision-maker will each get £6.20. If the project is not completed successfully, you and the other decision-maker will each get £0.60.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 5

You are a **GREEN** decision-maker. You are randomly paired with a **BLUE** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **BLUE** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 35 in 100. If the project is completed successfully, you and the other decision-maker will each get £9.70. If the project is not completed successfully, you and the other decision-maker will each get £0.50.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

Question 6

You are a **GREEN** decision-maker. You are randomly paired with another **GREEN** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **GREEN** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 45 in 100. If the project is completed successfully, you and the other decision-maker will each get £6.20. If the project is not completed successfully, you and the other decision-maker will each get £0.60.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Do you as decision-maker assign the project to the candidate or not?
Your answer: _______

[PROJECT CANDIDATE IDENTITY SESSIONS]

You are a BLUE project candidate. This is your role for all remaining questions.

In the boxes in small print you see the questions as given to decision-makers. In each answer slot provided, please answer whether you think the decision-maker will assign the project to the project candidate or not. **For each correct answer you will get £3.**

Question as seen by decision-maker

> You are a **GREEN** decision-maker. You have a budget of £3.42. You face a randomly selected **BLUE** project candidate. You have to decide whether to assign a project to this candidate or not.
>
> - If you decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.
> - If you decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 35 in 100. If the project is completed successfully, you will get £9.70. If the project is not completed successfully, you will get £0.50.

Question 1: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

> You are a **GREEN** decision-maker. You have a budget of £3.42. You face a randomly selected **GREEN** project candidate. You have to decide whether to assign a project to this candidate or not.
>
> - If you decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case you simply keep the £3.42 for yourself.
> - If you decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case you pay the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but you know that chances of success are 45 in 100. If the project is completed successfully, you will get £6.20. If the project is not completed successfully, you will get £0.60.

Question 2: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

You are a **GREEN** decision-maker. You are randomly paired with a **BLUE** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **GREEN** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 45 in 100. If the project is completed successfully, you and the other decision-maker will each get £6.20. If the project is not completed successfully, you and the other decision-maker will each get £0.60.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Question 3: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

You are a **GREEN** decision-maker. You are randomly paired with another **GREEN** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **GREEN** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 45 in 100. If the project is completed successfully, you and the other decision-maker will each get £6.20. If the project is not completed successfully, you and the other decision-maker will each get £0.60.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Question 4: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

You are a **GREEN** decision-maker. You are randomly paired with a **BLUE** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **BLUE** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 35 in 100. If the project is completed successfully, you and the other decision-maker will each get £9.70. If the project is not completed successfully, you and the other decision-maker will each get £0.50.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Question 5: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______

Question as seen by decision-maker

You are a **GREEN** decision-maker. You are randomly paired with another **GREEN** decision-maker. Each of you has a budget of £3.42. You and the other decision-maker face a randomly selected **BLUE** project candidate. Each of you has to decide independently whether to assign a project to this candidate or not.

- If you both decide not to assign the project to the candidate, then the project will not be assigned to the candidate. In that case each of you simply keeps the £3.42 for him/herself.
- If you both decide to assign the project to the candidate, then the project will be assigned to the candidate. In that case each of you pays the candidate £3.42 for his/her services. You do not know in advance whether the candidate will complete the project successfully or not, but each of you knows that chances of success are 35 in 100. If the project is completed successfully, you and the other decision-maker will each get £9.70. If the project is not completed successfully, you and the other decision-maker will each get £0.50.
- **If you and the other decision-maker make different decisions, no project assignment decision can be implemented and your disagreement will cost each of you £3.00 (to be deducted from each budget of £3.42).**

Question 6: Do you think this decision-maker above will assign the project to the candidate or not?
Your answer: _______